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Pompeii and Herculaneum.

IN the voluminous correspondence of Horace Walpole will be found an interesting letter, dated June 14th, 1740, N.S., sent home from Naples almost at the moment that the first excavations of Herculaneum made known to the world the treasures that were buried beneath the lava and the ashes of Vesuvius. In this letter, addressed to Richard West, the grandson of Dr. Burnett, the botanist, Walpole writes:—"This underground city is perhaps one of the noblest curiosities that has ever been discovered. It was found out by chance, about a year and a half ago." The truth of this prophecy has singularly been fulfilled. A few years only elapsed from that date, during which time Pompeii and its treasures were unearthed, until the artistic world of Europe was made as familiar almost then as we are now, with the wonders of the buried cities of the Campania, through the great works of Gell and Hamilton, the "Antichità d'Ercolano" and its French translation, and the exquisitely-rendered engravings of that master of illustrated publications, Piranesi, and his industrious assistants. All interested in Pompeii will remember the superb work of Lieut.-Col. Cookburn, "Pompeii," published as far back as 1819, and the letter-press accompanying the drawings in which,—one of these, representing the eruption of Vesuvius, was from a sketch by the late John Martin,—was from the pen of an earnest student, who still lives, loved and respected, among us,—Professor Donaldson.*

What has since those days been done in excavating Pompeii has been made known to the world from time to time in these columns, but notwithstanding the industry and care that have been bestowed during the last few years on the excavations, it will be found that but little has been recovered beyond repetitions of the wonders that were revealed during the first years of the discovery. In revisiting the Museo Borbonico after many years, the artist will find but little more than many additions to the antiquarian portions of the museum. Exceptions, of course, there are, but nothing equal in any case to the famous series so long known as the *Dansatrice*, although among the newly-found bronzes, perhaps the small drunken Faun, discovered within the last few months, is, in our estimation, likely to rank high among the noblest existing works of antiquity, the bronzes of the Greek artists. Archæologically and architecturally this discovery is most interesting, as the house in which this great Greek work was discovered was one of those of the latest erection in Pompeii, and unique in its architecture. Ill-constructed arches had been introduced, springing direct from the columns of the *peristyle*,* and the walls are miserably decorated.

It is very near where this bronze was so recently discovered that those who remember Pompeii in the old days will be reminded of its entrancing beauty and interest before the Government had taken upon itself the care of the classic city, and before it was determined—as it was necessary to do—to protect the crumbling walls by aid of brick-supports and over-hanging tiles, a sad necessity which has destroyed cruelly the picturesqueness of the outline in nearly all the familiar points. We remember some years since, not many years before the death of the late accomplished Frederick Cockerell, that he passed some time at Pompeii in sketching with his careful hand and thoroughly well-instructed mind the ruins of the city; those sketches, wherever they may be, should be preserved.

For the moment the excavations now being proceeded with are retarded by the obstinacy of the owner of a farm that has quietly existed for some centuries over what we may be quite certain is a very interesting portion of the buried city; the work is retarded, fortunately, we may say, because from what we have lately seen at Pompeii it is only at about this spot that the old picturesqueness of the Roman ruins can be seen as they were some years since. The rest of the city, with its wonderful interest, is now better kept, in better order, cleaner and better drained, than perhaps any other city in Italy; its houses all duly numbered, the streets distinctly marked, the roads and by-ways in perfect order, with a thorough system of police, scarcely a blade of grass allowed to grow in its now crowded streets, crowded by strangers from all parts of the world, all of whom enter this ancient Roman city by a patent turnstile which turns not before each visitor has deposited his two francs towards the continuation of the excavations. By this means the Government of Italy obtains yearly the very handsome sum of about 30,000 francs, with every prospect of this revenue increasing greatly year by year.

Those who have known Naples for some time find the pleasure of a visit to Pompeii is greatly destroyed by the modern system of entering through a turnstile, and when one is not provided with a special permission to wander about at leisure, the conduct over the ruins, even by the civil Government official who is tailed off to each party of visitors, would, we suspect, be to Mr. Arthur Sketchley or Mr. Burnand exceedingly provocative of merriment; for notwithstanding the attention of the custodians, the extraordinary variety of strangers that have to be trotted round in the course of the day gives rise to the most amusing episodes that sadly interfere with the serious object of a visit to Pompeii. Indeed, during a recent visit, we observed the possibility of Pompeii being made at times almost as great an aid to those lovers of social amenities, that large class of people who visit the Continent with the idea of increasing their visiting-list at home, as Mentone, Nice, or any other of the fashionable resorts. The time has certainly come when it is exceedingly risky to visit Pompeii in one's ordinary travelling costume, unless one is utterly regardless of that nice attention to the fitness of "get-up" that marks a correct sense of the exact hour of the day.

Notwithstanding the change in the system by which one now visits the ruined town, and notwithstanding the large element of destruction afforded by the numbers of strangers who literally invade, especially at certain seasons, the deserted streets, the old features possess none the less interest, and the visit to Pompeii and the insight it gives us into the life of our classic forefathers remains unquestionably one of the most vivid impressions that one bears away from a tour in Italy. One has seen before reaching Naples many museums and, above all, many towns, but they have become too much modernised to impress any but the most imaginative; but in Pompeii we find a city of the ancients almost untouched. The streets and pavements are the same they trod 2,000 years ago, and the deeply-worn wheel-marks in the well-paved stone streets speak of the busy traffic of a city not so very unlike our own great centres of population. After one or more visits to the superb museum in Naples, with its marvellous collection of works of art and scarcely less artistic domestic utensils, furniture, and what not, the existence in the houses that one is shown becomes realisable, and as the still plainly legible election programmes and notices of apartments to let conspicuously painted on the street front of many of the houses meet the visitor at every turn, as the theatres and the baths, the shops and the market-places, the temples and the tombs, follow each other, he gains in a few short moments a clearer insight into the life of these past generations so strikingly like and yet so different from our own, than the years of school teaching and familiarity with classic authors have been able to give. Here he sees the scattered relics of the art of these days in their original places, and can picture with more or less accuracy the surroundings that are wanting.

With the large space of Pompeii so far excavated, it can be understood how impatiently certain students look upon the slowness of the advance made. Considerably more than half of the known area of the city remains still buried, and a century and a half has been passed in unearthing the portion with which we are now familiar. If we mistake not, the present director of the excavations has calculated that at least another seventy to eighty years are necessary,—continuing the explorations at the

* Pompeii: Illustrated with Views, &c. The descriptive letter-press to each plate by T. L. Donaldson. London: Murray. 1819 and 1827. Two vols. folio. The work is of the same form as Stuart's "Athens."

* It is this very interesting feature to which Mr. Russell Forbes alluded in our columns not long since. See *Builder*, July 9, 1881, p. 44.

existing rate,—to unearth the whole city. In the mean time, there are not wanting partisans who sadly deplore the activity of the excavations on the somewhat sentimental ground that we are robbing our descendants of the pleasure that we have so largely experienced in the progress of the works during the last two generations. Certainly those who come after us cannot hope to see the city as we do; for those who remember Pompeii before the days of Signor Fiorelli, and the energy he introduced into the work, will tell one how sadly the beauty of the general effect has suffered, in spite of the learned director's efforts to arrest the injuries of exposure to the air and light.

There is, again, another race of students who take a higher ground, and who would wish the excavations of Pompeii to give way to a more systematic exploration of Herculaneum, as a field of far greater profit; who argue,—and certainly with truth,—that from what we know of Pompeii we may judge of what remains; that further research will tend far more to satisfy the archæologist and antiquary than the artist, while the buried houses of Herculaneum hide in their gloom and obscurity treasures of classic art of far greater interest than any that are likely to be found at Pompeii, with the character and tastes of whose inhabitants we are now more or less familiar. Certainly these earnest students are justified by what the very unsystematic excavations of Herculaneum have so far revealed. The choicest bronzes of the Museo Borbonico came from Herculaneum, the excavations of which remain yet scarcely commenced for want of funds to overcome the great difficulties met with. Our small knowledge of Herculaneum has shown us that its inhabitants were superior in their tastes to their neighbours at Pompeii, which, let it always be remembered, was a town of second or even third order, and in which it is now so easy to trace the almost painfully evident decline of the great art of the Greeks. For our part, we would much prefer, even if the excavations of Herculaneum involved much more time owing to the nature of the lava, than those of Pompeii, the inquiry in that direction than in the more popular city of Pompeii, because we have a stronger hope that in Herculaneum more treasures of an artistic kind are likely to be discovered. Especially, we are likely to find more works of art in bronze, that material in which all great artists have worked so successfully, and which time under almost all conditions has treated with so much tenderness that it is from the study of the bronzes of antiquity that we come nearest to a perfect knowledge of the art of the classic masters.

The bronzes discovered at Herculaneum have preserved almost precisely the tone and colour, the very surface,—the *patina*, as experts understand it,—that were seen by the great art-lovers eighteen centuries ago, a fact due to their preservation in the lava, which has in so many cases altogether left uninjured the surface of the bronze, while the chemical action of the cinders and boiling water poured down on Pompeii in the great eruption has not only corroded the surface of the bronzes there found,—so much so in many cases as almost to obliterate the form,—but by the corrosion has added a fictitious beauty, what one may almost call meretricious, in the fascinating tints of tender blue and green gradating into the richest tones of olive and purple.* The recently-discovered Faun,—to which we have referred,—is a splendid instance of this lovely colour caused by the conditions to which the bronze has been submitted: perhaps, beautiful as is this figure, it owes not a little of its charm to its present brilliant colour, which is, of course, altogether absent in any photographic copy, and which we find grossly exaggerated in most of those modern imitations which the French and other manufacturers have put into the market.

But apart from the fact that the bronzes found at Herculaneum have not, as we have above remarked, been submitted to this corrosive action, their artistic merit has been acknowledged to be of an exceptional nature, and yet a century and more has elapsed since the bronzes from Herculaneum, which form so conspicuous a feature in the Museo Borbonico, were brought to light. It will be seen that the artists who prefer that the energies and funds of the existing excavations should be directed towards Herculaneum have not merely conjecture on their side.

We gladly take this opportunity of mentioning the recent publication at Naples of a monthly review termed *Pompeii*, the aim of which, while amply suggested by the name, may be said to be somewhat more than a mere chronicle of the progress made in excavating Pompeii. In the programme attached to the first number of this publication, the director, Sig. Aug. Mele, set forth the intention of his journal to popularise and render industrially useful the science of archæology, at present too exclusively a subject of interest to a privileged few. By robbing it of the severity which is usually attached to its study, it is unquestionable that much may be done to spread in productive quarters the teachings that archæology regarded and pursued in the right spirit is capable of affording. This is to be more particularly the aim of the new publication; to render practical the archæological researches into the art of the classics, and in the several parts into which the publication is divided, "Industrial Archæology" is to take a large and important share. By the aid of careful illustrations,—in which the new photographic processes have been brought into requisition to reproduce the original drawings of the artists employed, a number of suggestive forms taken from the classic models found in Pompeii,—so rich in such models,—will be published, to guide the modern designer and producer.

The field of suggestive ornament thus open to the editors is scarcely likely to be exhausted within a reasonable period. To all who are familiar with the treasures of what we should now call "industrial art," collected at the Museo Borbonico, the wealth of material will be remembered. In literally every direction, in every utensil and object for daily use, a due consideration to its artistic ornament seems to have been a *sine quâ non* with the ancients; the rarest damascened silver work inlaid into bronze decorates the simple bed-head, the chair, and the litter; the keys found are in many instances richly damascened with silver, while not a vase or dish is to be found in the whole collection but what gives evidence of the minutest artistic attention. The distinction between the artisan and the artist was then well understood and clearly defined; in the case of a vase, for instance, if we mistake not, it was customary for the body of the vase to be the work of the artisan; its handles, and their mode of attachment, were left to the artist.

We have a strong belief that a renewed acquaintance with the treasures of classic art will be found to serve as a wholesome antidote to the recurring introduction of new fashionable "styles" and the sentimentalism of a certain kind of art about which we hear so much, and yet of which we so often find our friends expressing their weariness and impatience.

* This chemical action of the hot volcanic water on the works discovered in Pompeii, and which is entirely absent in those discovered at Herculaneum, enables even the uninitiated, when once informed of this fact, to judge from which city may have come the bronzes that are to be found in the museums of the world. Those from Herculaneum are black; those from Pompeii oxidised green. When these latter are of recent discovery, the oxidisation is of a beautiful deep blue colour, which, however, on exposure to the air slowly turns to green. It is needless to say that in the fabrications this blue is basely imitated, and never changes.

SOUTH KENSINGTON PRIZE DRAWINGS.

The annual exhibition of drawings and designs for which prizes have been awarded by the Department of Science and Art has been arranged this year in the south galleries (upper floor), adjoining the Horticultural Gardens. The drawings are not grouped so systematically as they might be, some classes of work being a good deal scattered. This applies especially to the architectural drawings, which seem to be hung in any corner where room can be made for them, instead of being grouped as one class.

It is, however, to these that we naturally look first, to see if any improvement has shown itself in this branch of the work of the Department, which has usually been very indifferent. There seems to be a little better work than in previous years, but that is not saying much. The gold medal for architecture is awarded to Mr. Herbert G. Smith, of Nottingham, for a design for a cathedral, which is illustrated by several elaborate drawings and a plan. The drawings show great industry and painstaking draughtsmanship, but they are certainly not remarkable as an illustration of modern Gothic design. The design is overdone with detail, wiry in effect, and wanting in real architectural solidity and dignity. No silver medal appears to have been given for architectural design. A bronze medal is awarded to Mr. Richard, or Richards, of Cardiff, for a design for a colonial town-hall. There are good points in the plan of this; the design is simply draughtsmanship, the repetition of thirteenth-century detail of French type. Mr. Price, of Nottingham, has a bronze medal for a cathedral design, which is "gim-crack" to a degree, and quite below the mark of what would pass as good at the Institute or the Architectural Association. There are a few very neatly-drawn designs for houses, each an imitation of certain accepted styles; some of them have the merit of being accompanied by plans. But the conclusion from looking at the architectural designs certainly is that the Department does not contrive to draw much architectural talent into its competitions. There are one or two careful bits of illustrative work; Mr. Pope's drawings from measurement of that curious piece of Gothic eccentricity, Cartmel Church, Lancashire, with its stumpy centre tower, with the bell-stage set diagonally on the substructure; and there are several tinted elevations from actual measurement of part of Greenwich Hospital, which speak well for the accuracy of the draughtsmen who measured and drew the building, for though by different hands, they are so precisely similar in appearance, and even in manner of shading, as to suggest at first the idea that they are multiplied copies of the same drawing. Mr. Woodhouse (South Kensington) takes a gold medal for studies and measured drawings of church porches,—a medal which seems rather easily won.

The drawings from casts of ornament are, in the best specimens, as good as work of this class could possibly be. The monochrome drawing of a piece of Roman ornament, shaded in sepia, by Mr. Marshall, of Chesterfield, for which the silver medal has been awarded, is a beautiful specimen of architectural detail-drawing; and we were much pleased also by the fine bold drawing in oil monochrome, by Mr. Stephenson, of Bradford (bronze medal), of a piece of acanthus scroll ornament, showing that the author fully understands the value of broad masses of light and shade on ornamental work of this class.

Turning now to the most important and difficult branch of all,—the drawing of the nude figure from the life, we find the gold medal for drawing awarded to Mr. Alfred Hitchens, of the South Kensington School, for a chalk drawing from a male figure holding a small sword, and in the attitude of a warrior disposed to conquer or die. The same model, in the same pose, is the subject of several other studies; the life-studies of this class appearing to come chiefly from South Kensington itself, or from Lambeth. We may, in the first instance, remark on the poor character of the models which these two schools seem able to procure, a point which we have noticed before. There is certainly nothing very inspiring, from an artistic point of view, in producing realistic copies of a figure which may be that of a most worthy and respectable man in his occupation, but which has certainly no form or comeliness that we should desire a repetition of his thin and scraggy outward semblance. We notice the same drawback in the other life-studies; short-legged and stumpy women, men of what is vulgarly called "pot-bellied" development, and so on. The practice in drawing is the same, in a sense, no doubt, but certainly the interest in drawing is not the same, nor the education of the eye and taste; and since it is unquestionable that better models than these are "in the market," we should have thought central schools like South Kensington and Lambeth might have afforded to procure them. Passing over this, we may say that the gold medal seems rightly awarded to this figure, which shows considerable freedom and mastery of drawing, and which we like rather the better that it is not overshaded and stippled like some of the others. At the same time, we have a most decided opinion that the lower leg, below the knee, is too long, especially in the right leg, unless the model was very abnormally proportioned; a comparison of the proportions with Professor Marshall's standard of the figure certainly bears out the opinion. The silver medal is awarded to Mr. Pearce, of Lambeth, for a rather weak study which has been overworked in the mere mechanical portion of shading and finishing. We have before expressed the opinion that both in the antique and occasionally in the life department, a good deal too much time is expended on this elaborate

surface finishing, which does not teach much. Miss Mary Drew and Miss Helen Jackson, both of Lambeth, take bronze medals for good drawings of the female figure, that of the latter especially, a back view study of the full-length figure, is a very good drawing. Miss Kate Evans (bronze medal) has a "time sketch" in crayon of a female head from life; but we are not told what the "time" was, which is certainly an element in judging of the merit of the result. The gold medal figure for oil-painting from the nude is better than any of these, and the result much more pleasing, the artist, Mr. Breakspeare, of Birmingham, having had the good fortune to have a fine figure with an expressive head to work from, to which he has done great justice both in drawing and colouring, and this may fairly be said to be the finest and most pleasing work in the collection. Miss Ellen Robertson, of South Kensington (bronze medal), has a good oil-painting of a head with a red fez, from life. The oil figure studies are not numerous, nor on the whole very noticeable, except the gold medal one. The figure studies from the antique are numerous and mostly very good, but too much care and time is bestowed on mere finish in shading. The authorities, however, do not seem to take this much into account in the awards, as the gold medal has been given, and rightly given, for a drawing by Miss Mary Surenne, of Edinburgh, which is less highly and smoothly finished than many of the others, but is more broad in style, and more correct and careful in the drawing of the extremities, than others in the same class of work.

The gold medal for sculpture has been awarded to Mr. Drury. This is called an honorary award, but we are not aware in what respect the recipients of honorary awards stand on a different footing from the rest. This is a seated figure, nude, of a man in the act of turning round, and half moving away as if startled by something. The extremities are roughly finished,—perhaps are not intended to be otherwise; but the general attitude and action of the figure show much energy and movement, and the arms are very well and freely modelled. The sculpture exhibits are not numerous. A silver medal is given for a cast of a caryatid figure for one end of a chimneypiece, which is very good, and well suited to its position; this is by Mr. Mark Rogers, of Lambeth.

Still-life studies in oil and water-colour are, as usual, numerous, and with a high average of merit. The gold medal for oil painting in this class is awarded to Mr. R. S. Morrison, of Liverpool, that for water-colour to Mr. Frank Suddards, of Bradford Grammar School; the latter shows some admirable work. But we prefer to turn to some of the examples of ornamental design, which deal with subjects more directly connected with our own. The gold medal for the Owen Jones competition is given to a design (for a carpet) by Mr. Gideon Fidler, of Salisbury, which is delicate and good in colour, but very deficient in design, consisting only of flower forms geometrically arranged, with no connexion or growth in the design, and the border, with its festoons hanging outwards all round, is very poor in taste. Owen Jones, we feel convinced, would have approved much more of the silver medal design, by Mr. J. H. Lamb, of Kidderminster, which is slightly raw in appearance in the colour as shown in the drawing, but is a very fine, rich, and original design of the true Owen Jones type. The gold medal for wall decoration is awarded to Miss Liberty, of Nottingham, for a good design in rather sombre colours. There are other designs very good in this class, but we do not impugn the award. The lace designs are many of them charming; we have always found them among the best things in the collection. The designs by Miss Mary Joyce, of Dover, for which the gold medal has been awarded, are very good, though we can hardly say they are superior to some others that are exhibited. Miss Joyce's designs, as well as a majority of those exhibited, are founded on realistic foliage. We doubt whether forms that are a little more abstract are not really better suited for lace. There are, at any rate, two very good ones, one of a rather Renaissance type, a curtain by Mr. Lawrence Kirk, of Nottingham (silver medal), which is very refined and well carried out, in the border especially; and another with a touch of Moorish feeling (the name of the author we omitted to note), which is very good; and there are other admirable specimens.

Among the remaining works are good designs for painted china plates by Miss Edith Robinson and Miss Alma Hodge especially; wall papers, which are very good, but which we cannot give space to particularise; a clever bit of original design for wrought ironwork by Mr. Albrow, formed from long reedy plant forms twined together, a trifle too naturalistic, but very suggestive and clever; some clever designs for mosaic floors, including an elaborate study by Mr. Stevenson for a floor founded on Celtic forms of ornament; an inlaid table-top design by Mr. Hayes, of Renaissance type of ornament, very good; and many other little bits of work which would well deserve praise if we had space to particularise them. In short, the department of decorative design seems in a very prosperous and encouraging condition; and if there is a certain amount of weak and uninteresting, or merely imitative work, there is hardly anything that is in bad or vulgar taste; and the mere fact that we can say this shows what an advance has been made in this class of design of late years. We should like to see a larger proportion of life figure studies of a finer type, and of original conceptions in figure subjects.

"SUGGESTIONS IN DESIGN."

The work published under this title* is an amplification of one published by the same author, under the *nom de plume* of "Luke Limner," in 1852-3; a good many of the sketches in the present work we remember noticing in the original one. The latter, we may frankly say, left on us the impression of a work showing some cleverness with a good deal of eccentricity, and with little indication of any serious aim. The present volume adds to the previously published "Suggestions" a considerable number of new ones, and a long and elaborate essay on ornament, dealing in a good many chapters with the respective characteristics of various styles of ornament, from the pen of Mr. J. K. Colling, whose own works, both in literature and in architectural design, have shown that he understands the principles of ornament. There is thus evidence of something like a serious intention in the work as now issued.

In his Introduction, Mr. Colling suggests, not without some truth, that civilisation has stunted what might have been the average power of drawing by the substitution of writing to express ideas, so that the mode of delineation generally distinguished as "drawing" has become in the scheme of education a secondary subject, not by any means to be taught as a matter of course, but only in exceptional cases, or left to be acquired by individual effort. Considering that writing expresses more complicated ideas, and expresses them with more completeness and certainty in general than drawing ever could, it cannot be doubted that writing is the more urgent necessity of the two for the conduct of life. But it is well to remember that in some ages and countries much less cultured than our own, a higher general power of drawing was attained than is possessed among us now, simply owing to the fact that it was a recognised method of communicating ideas, and as such was generally learned and practised. There is no doubt that if drawing were made as essential a part of primary education as writing now is, and if failure to acquire any command over it were regarded as a failure to be rather ashamed of, as it is in the case of writing in schools, there would be an astonishingly larger percentage of persons who could draw fairly than there is to be found among us at present. As it is, it is never expected that any one, because he is an educated man, should therefore be able to draw even the simplest object, or should evince even the most rudimentary notions of perspective. If he does so, it is a feather in his cap, and he is a kind of marked man among members of ordinary society; if he does not possess the least vestige of the power no one expects, or feels entitled to expect, it of him. Now, as it is perfectly certain that the vast majority of people can learn to draw if they are taught, it seems absurd that we should have this state of incapacity to handle a pencil so prevalent among us, and that we should see an otherwise cultivated and clever man so hopelessly at a loss if, on some unwonted occasion, he attempts to express with a pencil his recollection of the form or construction of some object which he wishes to describe. Nothing is more ludicrously painful than the hopeless "dash at it" which such a man makes with a pencil when he ventures to attempt the use of one; scribbling at random on the paper in search of the lines which would express what he wants, but which he cannot stumble on. A very little direct education in the matter would probably have taught most of these bewildered ones, if not to originate design, at any rate to know how to reproduce a form on paper correctly; and when the time comes when drawing is recognised as a proper branch of liberal education, probably even those who advocate it may be surprised to find how much can be done by the majority when they are once persuaded that the art, up to a certain point at least, is as easily acquired as a good many other accomplishments which are not considered extraordinary or out-of-the-way achievements for people of average talents. We have been saying this for many years, and a belief in the truth of it is slowly growing.

This, however, is by the way, Mr. Colling's remark in his Introduction having set us off on a subject we are at all times eager to recommend to public consideration. Turning to Mr. Colling's "principles of design," which are stated in a tabular form in the next chapter, we find ourselves in agreement with nearly all of them, but not always with the reasons given for them or with the comments added to them. There are some, however, which are to be noted because they are not so often insisted on in theory as others, and are constantly broken in practice. For instance, that "ornament in relief should not be added to or overlaid upon the construction. . . . . For example, wreaths and festoons are frequently placed so as to hang over arches, mouldings, and other enrichments. They are thus separate from and added upon the construction, and therefore, never aid the beauty of a work." This has been long recognised in theory in regard to the addition of useless architectural features, but the very architects who would avoid adding a sham buttress or a sham turret with the idea of ornament, do not scruple to overlay a building with impertinent ornaments which have no relation whatever to the constructive design of the building, and this fault is just at present absolutely rampant among us. Again, "all ornament should be taken or worked out of the solid material, not added upon it. . . . . In wall surface, the carved enrichments should be taken out of the wall, not added to it;" a maxim the truth of which will be intuitively felt by every one who has a grain of innate perception of the fitness of things, but which is frequently ignored by people who are supposed to represent artistic culture, and who, therefore, might be expected to know better. In illustration of the axiom that "all ornament should be subordinate to the subject ornamented," Mr. Colling gives the very apt illustration of the class of carved sandal-wood boxes so familiar to students of Indian art, in which, as he says, the form of the box is not in any way altered by the vast amount of ornament carved upon it. But when the author repeats the axiom, before laid down so strongly by Owen Jones, that "all ornament should be founded on a geometrical basis," and adds that "this is a natural law which may be found in nature by study and observation," we must differ from him. It is found in nature, undoubtedly, but by no means with that frequency and regularity which would justify us in speaking of it as a natural law. And, in fact, the implied necessity of going to nature to justify everything we do in ornament argues a mistaken view of the subject. The principle which is followed out in the geometrical spacing of ornament is one which has its root in metaphysics, not in natural forms at all. Ornament is the arrangement and treatment of forms which may or may not be derived from external forms in nature, according to laws which are very deeply seated in our conceptions, but which are based on metaphysics, on the abstract proportions and relations of numbers and geometry, not upon the habits of nature as illustrated in her visible and palpable growths. Besides, in laying down such a rule as this, although we hold it to be in the main a perfectly sound one, there should, at least, have been some hint of the fact that there are schools of ornament which have come in for much admiration of late, in which geometrical spacing is

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* Suggestions in Design, being a Comprehensive Series of Original Sketches in Various Styles of Ornament, arranged for Application in the Decorative and Constructive Arts. By John Leighton, F.S.A. With descriptive and historical letterpress by James K. Colling, F.R.I.B.A. Blackie & Son: London, Glasgow, and Edinburgh (to date).

palpably and almost studiously ignored. We are of the opinion, which we have several times before expressed, that Japanese ornament, the principal representative of this non-geometrical school, is much over-rated at present; but still it is far too important a fact in ornament to be ignored. (It is not ignored in the illustrations, but it is, apparently, in the "principles.") Besides, without going to anything so lawless as Chinese and Japanese ornament, we find even in Indian ornament, in embroidered stuffs especially, the most beautiful floral combinations which are sufficiently conventionalised to come under the head of ornament, but which, nevertheless, show little if any adherence to geometrical spacing. Again, when it is said that decoration should not be shaded to imitate work in relief, though we entirely agree that it should not, there ought to have been some recognition, by way of a note, of the fact that a large school of painted ornament in the Renaissance period, having some remarkable merits of its own, is worthy of admiration in spite of its undoubted impurity of taste in this respect. Then, in saying that some colours in different tones may be used one upon another, as light and dark chocolate, it is superfluous in any case, and not quite correct, to instance as an example of this in nature the differing tones of the fronts and backs of some leaves, &c. We do not go to natural facts such as these for authority for the arrangement of colours in decoration, any more than we go to natural sound for an authority for the combination of musical sounds. It is a question half of reasoning, half of the education of the eye, and combinations of colours may be very harmonious and very pleasing in effect in decoration, of which we do not find any examples in nature. Both the design and colouring of ornament, in fact, though in both we may receive and adopt hints from nature, are in reality matters of art, and of thought, and artistic perception,—not of imitation of nature. "The primary colours,—red, yellow, and blue,"—ought hardly now to be referred to without a hint that the most recent theory has altered the conception and nomenclature of primary colours, nor is it quite safe to say that, in ornament, these so-called primaries should "always" be used sparingly, and in small quantities. This looks like a repetition of the doctrine of Owen Jones, who was very positive on this matter. It is a rule that generally may be followed with advantage, but there are and have been brilliant exceptions to it, producing very bold and fine results. Look at the masses of red in Pompeian decoration, for instance.

In giving an analysis of the various schools of decoration, Mr. Colling looks at his subject very much from an architectural point of view, and connects the changes in taste in regard to ornament very closely with the architectural style of each age and country. This is reasonable to a great extent, no doubt, and a very natural way for an architect to look at it, but still ornament, even when connected with architecture, has an independent life, as we are reminded in finding, as we sometimes do, ornaments of such very similar type in connexion with perfectly distinct and differing architectural styles. The analysis of the styles of ornament contains no new suggestions, as far as we observe, nor, we must say, is it presented in such a manner, speaking from a literary point of view, as to bring out the interest of the subject very fully; but it offers a useful *resumé* of the leading characteristics of the different styles of ornament. We observe that in speaking of Moorish ornament Mr. Colling says that the designers of this school used the primary colours on upper portions of objects, placing blue in the shade, and gold on objects exposed to light. Blue in the shade is certainly not an invariable rule, for there are specimens of Moorish ornament in which the strap work separating the interspaces, and standing in relief above them, is blue.

A chapter is given on floral decoration, which Mr. Colling made a special study of a good many years ago, and on which he speaks with the authority of one who thoroughly understands his subject. This is the most useful of all the literary portion of the book. But we must say a few words as to the practically illustrative portion of the work. The reader must not rashly suppose that because he sees the words "Greek," "Roman," &c., at the heads of the pages, the examples given are *bond-fide* specimens of the ornamental art of the nation indicated. They are specimens of design by the author, following the principles of the various schools of ornament named, and, in fact, embodying suggestions in regard to the further development of the types most characteristic of each class of work. This, it will be seen, is a very ambitious motive to adopt, and, at the same time, it is one of which we can hardly see the object. If the author were a young designer of ornament, working to bring himself into notice professionally, we could understand the object of the publication; but that is not the case, as far as we know. The value of the suggestions must lie, therefore, in their "suggestiveness,"—strictly speaking, in their power of setting other designers thinking on the possible development of existing types. And we fear their value in this way is not very great, and that most people who are capable at all of working out suggestions of this kind to good purpose, and to the production of anything really beautiful and original, would be more likely to do so by reverting to the original types and starting fair for themselves than by following Mr. Leighton's rather eccentric suggestions. We should be very glad to speak more cordially of the book, for it represents a great deal of work, and there is a good deal of originality of a rather queer sort scattered about the pages; but "there's where it is,"—it is mostly more or less queer, and we hardly know in many cases whether to think the author is joking or not. The author does not catch the real spirit of the styles he professes to suggest upon in some cases; certainly not in the pages called "Gothic." The book is rather amusing to turn over, and here and there we may see a suggestion which it would be worth while to turn to account in a rather better way than the author has done. But in the main we fear we must describe them as designs evincing a certain cleverness with a want of refined taste, which occasionally merges into vulgarity, artistically speaking. It must be admitted that to carry out such a scheme as this at all so as to make it of any real value would be very difficult, and would require very high powers and very cultivated taste, and these Mr. Leighton can hardly be said to possess, if we are to take these designs as a fair indication of the extent of his talent. We are disposed to think the work will be chiefly used as a sort of pattern-book by that class of ornamentalists in various departments who look out for forms ready to their hands.

PROGRESS AND PROSPECTS OF ELECTRIC RAILWAYS.

The electric railway, we hear from Berlin, is there proving to be so great a success, that it is already in contemplation to apply the same mode of moving trains to the St. Gothard Tunnel, and to the Metropolitan Railway.

With regard to the St. Gothard Tunnel, it may be presumed that the coast is tolerably clear, and that if it can be shown that electric propulsion is, all things considered, likely to prove the best and the cheapest, Messrs. Siemens, on the one hand, and the directors on the other, will thrash the matter thoroughly out.

With regard to the Metropolitan Railway, the case is different. There all the arrangements are made, and are in excellent working order. More than 400,000*l.* have been expended on working stock. Not an interval of five minutes during eighteen hours out of the twenty-four passes without a train running over the rails. Before, then, any question can be raised as to change in system here, two things are requisite. First, the electric system must be shown to be as reliable and as manageable as the locomotive system; secondly, it must be shown to be considerably cheaper.

We are not advancing this statement with the view of throwing cold water on an invention which, if fully successful, will be a success of a very high order. We are only desiring to direct into the groove of practical inquiry that energy that may otherwise be wasted in vague and profitless speculation.

As to the first point, the practical working of the line, we have nothing at the present time to say. Details will, no doubt, be forthcoming, and if they prove satisfactory, experiments will in due course follow, made on some branch line or short portion of railway, where positive results can be obtained without interfering with actual traffic. We mean, of course, in this country.

What we wish to discuss is the limit of possible advantage, or the reverse, in a pecuniary sense, to be derived from the substitution of the electric motor power for the heavy locomotives which now propel the trains of the various subterranean railways through the metropolis.

On this highly-important subject we should be able to speak with more precision if the official returns of the English railways furnished the details of work actually done in the conveyance of traffic, which are necessary in order to inform the shareholders of what part of their business does, and what does not, pay. But notwithstanding the persistent refusal of this information, we are able, by working from the details given by the directors of foreign and colonial lines, at all events to lay down certain limits within a trifle of exactitude.

The average cost of moving 100 tons of loaded train for one mile on the railways of the United Kingdom in 1879 we estimate at 20·76 pence, out of which 5d. was the cost of locomotive power alone. From the data furnished by the Blackwall Railway we arrive at the conclusion that out of this 5d. per 100 tons taken one mile, 4d. was expended in moving the locomotives, and 1d. in moving the train. This 4d. per 100 tons per mile, or approximately per train mile, is therefore the limit within which any possible saving must be confined.

On the Metropolitan lines, however, the cost of locomotive power is greatly increased by the frequent stoppages, the high speed which it is necessary to get up between the stations, and the tearing action of the brakes, alike on the engines, the trains, and the rails. We think it will be found that it would not cost more for locomotive power and maintenance to run a metropolitan train for twenty-four miles straight on end without stopping, than to run the usual stopping train from Moorgate-street to Praed-street. Thus while, owing to the good loading and the consequent low tare, the Metropolitan lines are worked at a lower percentage on their receipts than any other in the country, they cost more per mile per 100 tons than any other. The great weight of the engines, which is a necessary consequence of the high speed and numerous stoppages on the Metropolitan lines, is such as to bear a far higher proportion to the weight of the carriages than would be otherwise needful. An estimate which we made on the best data accessible in 1875 gives a cost of 45·7 pence per 100 tons per mile, or about 2¼ times the average of the English lines. For locomotive power, maintenance, and repairs, alone, the cost was 17·9 pence against 11d. on the average of the United Kingdom.

For maintenance and repairs, on the average of the United Kingdom, as aforesaid, the cost is 6·6d. per 100 ton miles of load conveyed. This is only 1·2d. per unit more than we arrived at for the Metropolitan line. We thus have a cost of 11·3d., for locomotive power and excess of charge of repairs, on which saving would be effected if it became possible to substitute the cheapest mode of applying power hitherto indicated for the locomotive. And if we take the resistance cost (or lowest ascertained cost), at 1d., there is a margin of 10·3d. per 100 ton miles out of which saving is conceivable. If we roughly allow the Metropolitan and Metropolitan District trains to average 100 tons each, load and all, a saving of 10d. per train mile would amount to more than 70,000*l.* per annum, or to an addition of 14¼ per cent. on the net profits of the two lines.

By the test of reduction to £. s. d., therefore, the conceivable saving to be effected by the replacement of the locomotive by electric propulsion is one of a magnitude well worth the attention of mechanical men, as well as of the engineers and managers of railways. Attention, of course, will be first given to those lines in which it is desirable to escape from the nuisance caused by the products of combustion. Through a long tunnel, if the passage of the locomotive could be avoided by any means that did not either reduce the certitude or increase the cost of the transit, a considerable advantage would be assured. As to the Metropolitan lines, the special cost of the sudden starting, high speed, and sudden stopping of the trains is such that the advantage of doing without a locomotive would be considerably more than on ordinary railways. There is this to be urged in favour of experiment with a view to decide these points that we have named as open, that just where the advantages of superseding the locomotives would be the greatest, the margin of possible saving would also be the greatest. That so much, or that any, saving is yet shown to be possible we do not say, for we do not know. But there is a great presumption in favour of prompt and exhaustive inquiry.

THE LATE MR. SAMUEL SHARPE.

The announcement of the death of Mr. Samuel Sharpe suggests to us many personal recollections of the laborious old Egyptologist. The comfortable old-fashioned residence long occupied by Mr. Sharpe at Highbury dwells in our recollection as one of those English homes of which our country has so much reason to be proud. Mr. Sharpe's long connexion with the old bank with which the poet, Samuel Rogers, was associated, and his immediate relationship by marriage with the family,—his wife was the sister of Rogers,—and Mr. Sharpe's great love, not alone of literature but also of art, possessing, as he did, a very thorough conventional acquaintance with its history and traditions, made his house a well-adorned receptacle of cherished memorials, not like the house of his brother-in-law in St. James's-place, not containing such famous treasures of art as that well-remembered house, but smaller objects, not necessarily of less interest because of less value, but such objects as the affectionate regard for beauty and historical interest give invariably to more than usually interesting surroundings.

Notwithstanding Mr. Sharpe's age,—he died at eighty-three, having outlived most of his beloved acquaintances, — he has left many friends to lament his loss, not alone in England, but abroad and in America, where, indeed, in certain circles his name is perhaps better known than even here. Mr. Sharpe's literary productions were numerous; his "History of Egypt" was published now more than forty years ago. His studies were almost invariably connected with Biblical literature and history, and in all instances involved an amount of laborious inquiry that his methodical habits acquired in business made comparatively easy to him.* His revised edition of the New Testament, translated from the original Hebrew, preceded by some time the recent much-talked-of edition, and to students is worthy more attention than it has so far received. Mr. Sharpe's munificent donations to the London University and School made him one of the strongest pillars of that institution, as he also was of the Unitarian denomination. His private charities and genial character made him beloved by all who knew him.

THE WATER SUPPLY DIFFICULTY.

The unusual drought of July, 1881, has been due to the concurrent causes of a very slight rainfall, and a very high evaporative power. What the combined efforts of the two have been over torrential districts (that is to say, over impervious soils, which afford no storage for rainfall), is illustrated by the portentous statement that the River Graveney, draining an area of about 8½ square miles, chiefly of impermeable London clay, which, on the 10th of October last yielded, on an average of twenty-four hours, 9,507 cubic feet of water per minute, yields at the present time only 4 ft. per minute! We hesitate even to quote such a statement, and only do so on the responsibility of such a well-known writer on sanitary engineering as Mr. Baldwin Latham.

Mr. Latham, however, is of opinion that there is no immediate danger of a failure in water supply in the great geological water-bearing strata of the country. It is rather early days, considering the unprecedented rainfall of the last decade, to talk about running short of water after a fine July, chequered as the weather has been by heavy thunder showers in many parts of England. But Mr. Latham says that the springs are falling at a much more rapid rate than at the same time last year; and that all streams deriving their supply from surface sources are at an extremely low point. In the red sandstone formation in the central parts of England the water is abundant, but in the oolite formation round Northampton there is a deficiency. Important facts of this nature should not be left to the detection of private professional men. The mere statement is enough to show how deeply we may hereafter suffer from the absence of a scientific department which should watch and give account of the state of the natural and ever-varying water stores on which the welfare of the country depends.

Another matter of great importance in a sanitary point of view is brought forward by Mr. Latham, as to which we shall be glad to receive the testimony of medical authorities. It is the statement that "there is the strongest evidence to show that diarrhœa is produced by the use of water at a temperature of 62°." As a simple statement, we apprehend that the above sentence, as it stands, is incapable of defence. But that it may include, or point to, a truth, seems to us to be indicated by the experience of Mr. Aitken, who opposes the statement of Mr. Latham. We doubt very much whether there is so large a use of water made for drinking purposes as is assumed; that is to say of water as drawn from the cistern. Between the use of beer and other artificial beverages on the one hand, and that of boiled water on the other, we should think that the drinking of simple water at 62° was the exception rather than the rule. However that may be, it is possible that, although the temperature of the water drunk is indifferent to the consumer, the rise of the temperature of masses of water to a given height may be accompanied by an indication of fermentation, confervoid growth, or some other induced condition unfavourable to health. And this, no doubt, is intimately connected with the character of the gathering grounds. At the Bombay Waterworks, says Mr. Aitken, "no men or animals are allowed to live on the gathering grounds, and there is no diarrhœa attendant on the consumption of the water." Nor is it a mere matter of expression with which we have to do. Mr. Latham holds that in those districts of the country which take their supply direct from wells, the water of which is of a low temperature at this season of the year, diarrhœa does not become epidemic. Mr. Aitken, on the contrary, holds that the prevalence of diarrhœa in a part of London supplied by the Kent Waterworks is due to the use of impure water from wells. Our own view, on the first aspect of the case, is that temperature, as such, is wholly unimportant; as, for instance, if boiling water be added to pure ice till a temperature of 62° is obtained, we should expect the water to be perfectly wholesome, though tepid to the palate. On the other hand, that impurities contained in either well or river water may develop a poisonous activity with a given rise of temperature is quite conceivable, and any good observations on that point will form a valuable addition to our sanitary science.

As to the remarks which we made with reference to the extra stress thrown upon some of the metropolitan water companies by the hot weather, they have received a very full confirmation from a letter written by Messrs. Joseph Quick & Son, of 29, Great George-street, Westminster, who write as having been for many years officially connected with the management of an important portion of the London water supply. During the year ending the 30th of June, 1881, the average daily supply of London has risen to 145,732,116 gallons. But during the month of June, the supply actually reached 162,305,736 gallons per day, or nearly 20 per cent. above the yearly average for 1877. As compared with the daily supply of last December, the supply in June shows an increase of 27,594,892 gallons, and the supply of one of the West-end companies on the 20th of July reached the extravagant and wasteful amount of 45 gallons per head of the population of the district for that day.

These facts do not more thoroughly substantiate the remarks we made on the subject than do the experience and candour of the writers support the opinions we have so often expressed as to the points where the main evils in the present system are to be detected. "The public have yet to learn," say Messrs. Quick, "that not only the suppliers, but also the recipients of the water, have essential duties to perform in connexion with the supply." The Parliamentary powers of the companies are not such as to allow of such adequate inspection on their parts as should prevent either waste or negligent and unsanitary pollution of the water in the house-cisterns; which, as a rule, are to be found in those very parts of the houses from which they ought to be as far as possible removed. "Things must, therefore, take their course until a metropolitan water authority is created, armed with sufficient power to act vigorously in the organisation of domestic and other water supplies, and compelled to exert its authority stringently, in order that the entire population may realise the full advantages of the supply, and no one be allowed to prejudice his neighbour's water rights by abusing his own."

The last sentence of this instructive letter might almost have been copied from our own columns. "The recent accident to the main of the Grand Junction Company which resulted in so much inconvenience to the tenants affords an apt illustration of the disadvantage of the present system, and of the advantages which would result from unity of management, and amalgamation of the various companies' works; for under the latter arrangement connexions could be made between the various works, and the mains of one district would be available for the supply of another in cases of emergency."

THE TRADE IN INFERNAL MACHINES.

Amid the unmitigated detestation which has been excited by the discovery of the long-laid plans of murder which have been brought to light from the holds of the *Malta* and the *Bavarian*, there is at least one ground of satisfaction. So far as is yet known, no British workman has been found ready, for any bribe, to lend his honest skill to the service of wholesale murder. That in so dense a population, where engineers and men of mechanical knowledge are relatively so numerous, and when trade, including their trade, is so slack, this is, indeed, matter for no small congratulation. Considerations of personal safety, indeed, may have induced the cowardly purchasers of these infernal machines to procure them in a foreign market, rather than to attempt to tamper with, or even to outwit, a needy English mechanic. But this supposition very little alters the aspect of the case. Whether the sneaking conspirators against society tried and failed to procure tools for their nefarious designs on English soil, or whether they were afraid to try, comes to much the same thing, as far as the credit of the English mechanic is concerned. Long, long may it remain so!

It can scarcely, we fear, be doubted that the events of the last eighteen months have but too much familiarised the public of these kingdoms with the accounts of deeds of murder, arson, and mutilation. The reprobation which is felt for such crimes is not less in any upright mind. The kind of horror which each new instance elicits may be less marked, but only so because the sense of surprise arising from utter novelty is dimmed. And while this is the case more or less with the best of us, what is likely to be the effect on the more ignorant and dangerous classes? No ugly phenomenon is more certain than the fact that crime, and more especially prodigious crime, tends to produce crime. It is as with some noxious weeds, which fill the neglected soil with their self-sown seedlings. One of the great arguments against public executions was the manner in which the visible exercise of violence against human life brutalised the spectators. The worse, rather than the better, elements of our nature are galvanised into abnormal exercise by sights of violence. And it is, in the same way, although (as Horace long ago pointed out in a less vivid manner), that the recounted details of crime tend to dull the sense of horror.

How the intelligence was brought to the ears of the Home Office, those who best know will be the last to tell. It is a matter for satisfaction that, as far as the *Malta* and the *Bavarian* are concerned, the news was given in time. But none of us ought to forget that the cunning of the murderers, shown by the actual despatch of two cargoes of barrels of cement, each containing a deadly consignment, marked by an inconspicuous sign, is hardly likely to have been detected in a first essay. It will be well to ascertain at Liverpool, at London, and at our other ports, whether consignments of cement, or of any articles out of the usual course of trade, have of late been received from America. As to the search that should be made for the consignees, it is needless for us to insist upon that.

The discovery of this diabolical plot, and more than a plot, as it involves the carrying out of the murderous design through the two distinct stages of the construction of the machines, and of their despatch to Liverpool, leads us to repeat the warning which we gave on the occasion of the less deliberately-prepared outrage at the Mansion House. It is this. In times of public danger,—and that we live in such times who can deny?—it is the duty of every good citizen, of every honest man, of every observant lad, to act as a self-constituted detective on the part of society. As a rule, it is almost impossible for

* Only as lately as to the *Athenæum* of July 16 last, Mr. Sharpe had contributed an interesting letter claiming for the Egyptian astronomer Ichonuphys the invention more than 300 years before the Christian era of the Leap-year.

any great mischief to be prepared without some sign. Something unusual is almost certain to occur: something to betray to the experienced eye an irregularity, an incongruity,—a need for explanation. The despatch of an article of the low value of cement from the United States to Liverpool was a case of this kind. To nine people out of ten no ground of suspicion would hence arise. But to the cement maker or seller, to the builder, the architect, the shipper, the carrier, the question would naturally occur,—"How is it that cement is consigned to Liverpool from the United States?" And with one or more of these specially informed people the consignment was sure to come in contact. "Who," they might ask, "is the consignee? What has he to do with American cement?"

This, of course, is easy to say now. But the need of vigilance cannot be too much insisted on. And as encouraging the watchful it is that we call attention to the unconscious warnings that treason is so wont to give. A spider's web saved the Bruce. The keenness of observation and inference that argued from the presence of the web that the cave was empty, was at fault in that memorable instance, as is usually the case when slight indications are relied on with the result of saving trouble. On the other hand, when a true and anxious vigilance is awake, no hint so slight but that its careful pursuit may lead to the saving of valuable life,—to the safety of a vessel or of a public building.

Since we wrote the above, it has been stated in the papers that "cement" had been received from America at Liverpool before the arrival of the *Malta* and of the *Bavarian*, and landed without examination. The strong effort which has been made to show that these deadly consignments were only intended as a scare, should be read by the light of that statement. Vigilance is imperatively demanded. The consignments which have actually passed the Custom House ought easily to be traceable by the police.

New York papers of the 29th of July state that a reporter of the press claims to have discovered that the infernal machines seized at Liverpool were made at Peoria (Illinois), and accuses the director of the Association of United Irishmen residing in Peoria of being connected with the conspiracy.

THE ABBEY YARD, WESTMINSTER.

Those, if such there be anywhere, who are contented with the present squalid and indecent state of the churchyard of St. Margaret's, Westminster, and of the dreary swamp (in wet weather), half paved with dishonoured gravestones, which form the foreground to the prospect of Westminster Abbey, as viewed from the north, will not be found among our habitual readers. That an effort is being made to remove this discreditable eyesore all persons of taste will rejoice. Our first suggestion must be not to overdo it. As to this, the very modest sum now asked from the public, 2,000*l.*, to place alongside an equal contribution already promised, is to some extent a guarantee against too much decoration. The great points to be borne in mind are, walls that shall protect without disfiguring, the area included, and sweep of fine turf, relieved, but not overshadowed, by shrubs, and sparkling, here and there, with flowers. We very much doubt whether evergreens should be planted in the area. Amid the dense impurities of the London air, vegetation that springs new from the soil in spring, and that fades before the alternating frost of winter, has a great advantage over permanent shrubs and trees, that are ever adding to the incrustation produced by the smoke and other products of combustion, on their trunks and limbs, and that never shake off the sickly paint. This, of course, is mostly the case with those very trees of which the appearance is the most picturesque in the winter. It is also the case with our forest trees,—the elm, the beech, the oak. It is true that they assert their own chartered rights to display lovely and tender foliage in the opening year. It is true that the leaves do not become wholly black before they would otherwise become brown. But the trunks and branches do. Large trees are not at home in London, nor likely to make themselves permanent guests, until we lessen the smoke. Even in the beautiful grounds of Chiswick House, where an area of real park yet resists the flood of cottage building that surges round the ducal boundary, the old cedars and pines are fading. The highest botanical authority in the country is under the apprehension that the decay cannot be arrested, and that trees on which Linnæus looked with admiration are yielding to the slow poison of the London atmosphere.

For trees, then, if trees must be had to relieve a broad sweep of turf with a bold hedging of shrubs, we recommend the landscape gardener of Westminster to study the best forms of the larch. This tree shares with the pine the advantage of bearing needle-like leaves, less likely to contract atmospheric contamination than the broader, softer, and more destructible foliage of our deciduous forest trees. And as it sheds its spines in the winter, it is likely to preserve greater foliage and vigour than any of the evergreen gymnosperms.

It is to be regretted for many reasons that the culture of the yew is now so much neglected. The yew is indigenous to the chalk downs of England. Its slow growth renders it so unproductive as a timber tree, that its encouragement, when England depended on the bow for defence, was made the subject of legislative action. Hence the presence of the yew in so many churchyards. With regard to the influences of London smoke on the yew, we cannot speak so definitely as we could wish. That the tree becomes frightfully black when growing near large centres of smoke, we well know. That it may preserve its vitality, in spite of its griminess, is possible. The juniper is another indigenous evergreen of extreme beauty. But we imagine that the juniper refuses to live in towns. The most graceful of this group of shrubs, the tamarisk, certainly does. We commend to the expert the question of larch, yew, or juniper for plantation in this venerable God's acre. We hope by next year to see level and well-shorn turf, and small beds of brightly-flowering plants,—no carpeting or formal "bedding out,"—covering a site so rich in proud memories, and now such a disgrace to the metropolis.

THE "SEBASTIAN DEL PIOMBO" OF THE NATIONAL GALLERY.

We spoke not long since* of our confidence that, in the hands of the present Director of the National Gallery, the "Sebastian del Piombo" would not be likely in the course of its restoration to receive the smallest injury. We were delighted, on visiting the Gallery the other day, to find our confidence fully justified, the grand old picture revealing more than ever its brilliant power and beauty. The "Raising of Lazarus" is not the only picture in our national collection that has gained much by the attention bestowed on it during the careful custodianship of Mr. Burton, and it is impossible, when we see the admirable condition of so many of our pictures and the care and thought bestowed upon them, to resist a comparison with the state of many of the great treasures of the national collections abroad. It may be that there exists a conviction in the minds of Continental custodians that it is dangerous to meddle in any way with treasures such as they possess, and we cannot but sympathise to some extent with this fear. At all events that appears to be the only excuse for the look of decay, of decomposition even, that appears in progress on the surface of several pictures in the collection of the Louvre, notably in the rare and famous picture the "Fête Champêtre," by Giorgione, in the "*Salon Carré.*" This picture presents a crumbling and slightly shrivelled appearance, the very reverse of what some people object to in the condition of our pictures, of being over-varnished.

There exists, it cannot be denied, a thoughtless, and, in some measure, a species of traditionary, system of decrying and abusing all restoration. Restoration in the case of old pictures, as of our great monuments, is absolutely necessary to preserve them from certain destruction in a more or less distant future; restoration, that is, of a preservative nature. It is to the care of the Louvre authorities that we owe the preservation, the very existence almost, of the "Marriage of Cana" by Paul Veronese. This picture, one of the first Napoleon's spoils from the Italian campaign, was in too dilapidated a condition at the time of the restitution of the rest of the Paris treasures to their respective countries, to make it worth while for the Austrians to transport it back to Venice. The huge canvas was, in fact, what the French understand by *hors de service*, and for forty years it remained in this state. Some years since the Louvre authorities boldly undertook the task of re-lining the ragged picture, and now the "Marriage of Cana" shines out, as it will for many a generation to come, the most brilliant item of the jewel-case of the French national collection. This we owe, as we do in many other cases, to intelligent restoration conducted under the eye of competent directors.

* See p. 39, *ante*.

IMPROVEMENTS AT IPSWICH.

NEW LOCK GATES, POST-OFFICE, AND MUSEUM AND SCHOOL OF ART.

Ipswich was *en fête* on Wednesday in last week on the occasion of the opening of the new lock-gates, the new Post-office, and the new Museum and School of Art.

The Lock Gates.—The Ipswich Wet Dock, to which the new locks are constructed to give improved access, dates its existence from the commencement of the reign of our present Sovereign, the first Ipswich Dock Act, under which Dock Commissioners were elected, and powers given them to make a dock, having received the royal assent on June 30th, 1837, during the early days of her Majesty's reign. It is now about ten years since the desirability of constructing a larger entrance began to be considered. The subject first came up at the general meetings of the Commission till the General Committee of Management were instructed to give their attention to it. At the July meeting of the Commissioners in 1872 the committee first reported in favour of a new lock entrance, which they suggested should be from 250 ft. to 300 ft. in length, 50 ft. to 55 ft. wide, and with a depth of 25 ft., subject to the advice of an engineer. They recommended that Mr. J. F. Bateman, C.E., F.R.S., should be consulted. Their report was adopted, and the chairman of the committee (then Mr. J. C. Cobbold), Mr. G. Mason, and Mr. R. C. Ransome, were appointed a sub-committee to confer with Mr. Bateman. In the following October Mr. Bateman submitted a comprehensive report, in which, after reviewing the past history of the port, and, considering its then condition, he sketched out a plan of works which he was of opinion would convert the dock and harbour of Ipswich into a first-class port. He proposed a new lock 300 ft. long between the gates, 50 ft. wide, and with a depth of 23 ft. 6 in. at high water spring tides, which is the work now completed, and in addition he proposed, acting upon a suggestion from Mr. George Mason, an embankment, with weir and sluices, across the southern end of the New Cut, which would give an additional dock area of nearly 20 acres, and, with a swing-bridge over the lock entrance, afford an opportunity for increased railway communication by means of the present line to the Griffin Wharf. He also suggested improvements in the channel of the river, and his total estimate, including 10 per cent. for contingencies, was 109,560*l.* A portion of these works, it was clear, could not be constructed at once, for a great deal of the sewage of the town was daily passing into that portion of the Cut which it was proposed to dam up, and Mr. Bateman's proposals having been referred to the Committee of Management, that body recommended, in November, 1872, that if 60,000*l.* could be raised, it was expedient to apply to Parliament for powers to construct a new entrance lock. Opposition to the scheme caused it to remain in abeyance until September, 1875, when Mr. Thomas Miller, C.E., the Commissioners' resident engineer, suggested a modification of Mr. Bateman's plans by placing the proposed dam across the Cut above the present lock-gates, with gates to connect St. Peter's Dock with the dock, and, after consulting Mr. Bateman, the committee adopted Mr. Miller's proposal, and recommended application to Parliament for powers to carry out the whole scheme so modified. This report was adopted, after three hours' discussion, by a majority of one,—twenty to nineteen, and the usual Parliamentary notices were given. At the July meeting in 1876 the committee recommended the construction of the lock entrance and other works, the Corporation being asked to guarantee the payment of the interest. The report was adopted by a large majority,—thirty-one to eight, and the Corporation subsequently agreed, under conditions, to give the guarantee asked for. Application was made to Parliament in the ensuing session, and the Bill met with no serious opposition, but when it came before the

House of Lords the Chairman of Committees, Lord Redesdale, refused to sanction the clause containing the Corporation guarantee, and that part of the Bill had to be abandoned. That, however, was not allowed to extinguish the enterprise which has now been carried so far towards completion. The Bill empowered the borrowing of 80,000*l.*, secured upon rates to be imposed on all goods imported or exported, of which 50,000*l.* has been raised, to be repaid within eighty years. That portion of the works, the completion of which was celebrated on the 27th ult., consists of the lock entrance, and the works necessary to enable it to be used. The lock, as we have already said, is 300 ft. long between the gates, and it is 403 ft. over all from pier to pier; its width is 50 ft., and at high water on an ordinary spring tide there is a depth over the cill of the gates of 23 ft. 6 in. The approach from the river to the lock, for about a quarter of a mile, has been dredged to a depth of 22 ft. at high water spring tide, and will be further deepened in course of time, but the full benefit of the increased depth at which the cill of the new lock is laid will not be felt until the river for a distance of about three miles down has been dredged to a corresponding depth. At present the upper part of the river is adapted to vessels drawing 18 ft. of water, but at Butterman's Bay, where larger vessels have been in the habit of lightering, and where heavy moorings and buoys have been laid down for their accommodation, there is a depth at low water of 22 ft. A deepening of the dock is also in progress from the new entrance upwards, so as to give 20 ft. of water at neap tides, which is a considerable increase, for the depth of 17 ft., recommended by Mr. Palmer, has only been attained over a small portion of the dock within the last seven years. This deepening will be gradually extended throughout the whole length of the dock, so as to admit of the safe discharge of the largest vessels within working distance of the quays. A new dredger, the *Lady Nancy* which is capable of dredging to a depth of 26 ft., has been purchased, and, along with the Commissioners' old dredger, is engaged with double gangs of men in carrying on these works as fast as possible. The contractors for the new entrance have been Messrs. Henry Lee & Son, of Westminster, whose accepted tender was 45,000*l.*, and we are informed that the extras are comparatively small. The first pile of the dam within which the works were constructed was driven on the 6th of June, 1879, and the date fixed for completion was the 1st of June, 1881, but the contractors obtained an extension of time. The work was practically completed on the 23rd of June, when the water was let in and the gates were tested and found to be perfectly water-tight. The total quantity of soil excavated amounted to 35,000 cubic yards, and when this had been removed there was about 17,000 yards of concrete laid, and about 2,400 yards of brickwork, or, roughly speaking, about a million bricks. The quantity of stonework was also considerable,—about 1,700 cubic feet of Cornish granite, which was used for the cills, hollow quoins, and other important parts of the work, and 18,000 ft. of Bramley Fall stone. Considerable difficulties (says the *Suffolk Chronicle*, from which journal we condense these particulars), were met with in regard to these foundations. There was an immense influx of water from the gravelly stratum overlying the chalk, as well as from occasional chalk springs. For many months it was necessary to keep a centrifugal pump in constant operation, and while the work was going on in the lower trenches the water lifted and daily discharged into the dock beyond the dam was no less than 5,000,000 gallons. Besides the difficulty arising from so large a flow of water, there was a further difficulty from the nature of the chalk, which was found almost throughout at a few feet above the intended foundation level. The chalk was so much comminuted that it became very little better than whitewash, and would frequently prove insufficient to support the weight of the men working in it. The contractors adopted the expedient of covering the worst part with bags of concrete, which pressed out the water so as to allow the chalk to reconsolidate and support the concrete in mass which was laid above. At other parts clean gravel was used for a similar purpose. As soon as these difficulties were surmounted the walls were rapidly erected. They have been built of concrete in mass and faced with hard brick: the floor of the lock chamber, which is in the form of a shallow invert, was laid in concrete. The works were so designed that the whole of the excavated material should be absorbed in the making of concrete and in the backing up of the quay walls, and this balance would have been effected but for the occurrence of the soft chalk, and the commissioners have supplied extra gravel to make up the deficiency. The framework of the gates, that is the three lower ribs, the top ribs, and the heel and mitre posts, are of greenheart. The remaining portion of the gates is of Baltic fir, so much of it as is below water being covered with creosoted boarding to protect it against the sea worm *teredo*. Each gate is provided with two sluices, and there are hand-power crabs for opening and closing them. Narrow bridges are provided for the crossing of foot-passengers along their tops. Provision has been made for the putting of a third pair of gates, closing in the opposite direction, against the river, for the purpose, in conjunction with the proposed dam across the New Cut, of shutting out abnormally high tides such as occasionally flood the quays and lower parts of the town, but for the present these will not be constructed, nor will the swing bridge across the lock, for which foundations have been laid, and which, when the dam across the New Cut is constructed, will enable a railway to be carried from the Griffin wharf branch of the Great Eastern line round the south end of the dock. Mr. Bateman's designs also included the construction of a timber jetty at the southern end of the lock entrance to protect the works and give warping facilities, but there is a diversity of opinion as to the necessity of this, and it will probably stand over till experience decides the point. In order to admit of the safe approach of vessels from the river, seven heavy moorings are being laid down at the entrance to Cliff Bight, with large buoys. Such are the works which Messrs. Lee & Son have for the past two years been carrying out, their representative at Ipswich having been Mr. Bispham. The works have been throughout under the superintendence of Mr. Thomas Miller, the resident engineer of the Commissioners.

The New Post Office.—Of this new building, which includes, besides the post-office proper, a set of offices occupied by the School Board and other public bodies, we gave a view and plans little more than a year ago.* The architect is Mr. John Johnson, of Queen Victoria-street, London, whose plans were selected out of twenty-two competing designs by Mr. Chas. Barry. The building has been erected by Messrs. D. C. Jones & Co., of Gloucester, Mr. G. J. Farrow being clerk of the works. The style of the building is Italian, and the Cornhill and King-street fronts are in Portland stone, the other two sides of the building being in white brick. In the Cornhill front, which consists of ground and first floors, there is a bold portico supported by eight columns, and surmounted by four figures in a sitting posture, representing Industry, Electricity, Steam, and Commerce, each figure being accompanied by appropriate emblems, which indicate with more or less distinctness the character it is designed to sustain. The public entrance to the post-office and also the letter-box for the reception of letters are beneath this portico. The opinion prevails locally that the one defect in the design is the number and steepness of the steps which lead up to the boxes. They are six in number, and much steeper than the steps up to the Town-hall. Between the windows of the first-floor, in front, are pilasters, above which are four ornamental terminals, and, in the centre, a handsomely-carved representation of the royal arms, supported by the recumbent figures of Genius and Science, which certainly very aptly represent the services which Sir Rowland Hill and Professor Wheatstone have rendered to our postal and telegraph system. In the carved heads of the first-floor windows of this front there are heads of Vulcan, Minerva, Mercury, Ceres, and Pluto, and the arches of the ground-floor windows at the angles on each side of the portico have similar carved keystones representing Jupiter and Neptune. On the King-street side of the building the windows on the ground-floor have carved jambs, cills, and heads, and the wall-space below them, which, owing to the fall in the ground, is considerable, is relieved with highly ornamented carved panels. The keystones of the window arches are carved with characteristic heads to represent Europe, Asia, Africa, America, and Australia. The first-floor windows are plainer in character, but there is a richly-carved frieze in the entablature above. The carving was the work of Mr. Baird, of London, and the sculpture is by Mr. F. W. Woodington.

The Museum and Schools of Art.—These buildings occupy the ground which was for many years kept vacant with the idea of building a church in it for a portion of St. Margaret's parish,—the site having been generously offered to the Museum Committee by its owner, the Rev. E. Hollond, when the project for a church was finally abandoned, at the price at which he originally purchased it. A more eligible site could hardly have been obtained, unless by the purchase of valuable property in the centre of the town, and the buildings, which have been erected from the designs of Mr. Horace Cheston, A.R.I.B.A., of Great Winchester-street, London, are well suited for the purposes for which they were intended. The plan of the structure is arranged in three blocks, the central block being recessed, and a terrace placed in the recess, from which there are separate entrances to each block, the central doorway opening into the main entrance-hall, and the two side doorways at the end of the terrace into paved corridors. The style of the building is a free treatment of the English Renaissance of the Stuart period, and the front elevation is relieved with ornamental panels in terra cotta, as well as with piers and pilasters of moulded and rubbed brickwork. The panels beneath the first-floor windows display festoons of fruit and flowers, and these run round three sides of the building; there are also small panels above the pilasters, filled in with representations of various fossils illustrating the different geological periods, these having been designed by Dr. J. E. Taylor, the curator, and executed, as was all the terra-cotta work, by Messrs. Doulton, of Lambeth. Other panels in the north and south gables are filled in with conventional dragons and foliage, and with portrait heads of Newton and Hogarth. In the panels in the centre gable are symbols of Science and Art, and those words are emphasised in arabesque panels over the windows within the terrace on each side of the main doorway. The central or main building and the southern wing are devoted to the Museum and Public Library; the northern wing is occupied by the Science and Art Schools. Entering by the main entrance, the visitor finds himself in a spacious entrance-hall, 33 ft. by 18 ft., whence he may advance to the central-hall of the Museum, ascend the handsome staircase to the first floor, or proceed by the corridors to the public library in the south wing, or to the rooms of the science school in the north wing. The central museum is a handsome room lighted from the ceiling, with a floor space of 2,350 square feet, being 71 ft. 9 in. long by 33 ft. wide. There is a broad gallery round the hall, 14 ft. from the floor, which thus doubles the accommodation for wall cases. This gallery is supported by substantial iron columns, to which an appearance of lightness is given by their being painted in two shades of green, and by the use of ornamental brackets. The upper room in the south wing, to which access is gained either from the landing or by glazed doors from the gallery of the central hall, is also a fine room. It extends the whole length of the wing, 103 ft., and is 25 ft. wide, and it is, therefore, the largest room in the building. It is 22 ft. 6 in. from floor to ceiling, and is flooded with light from the south and east sides. The ground-floor of the south wing is divided between the public library and a room for use by the curator and for committee meetings. The library is a spacious room, 76 ft. by 25 ft., and 16 ft. high, with a richly-panelled ceiling, and moulded and dentilled cornices. The north wing, devoted to the Science and Art Schools, is cut up into smaller rooms. The science school is on the ground-floor; a science class-room, 40 ft. by 20 ft., and a science master's-room, 18 ft. by 12 ft. 6 in., as well as a laboratory, are provided, and this wing also includes porter's-room, general cloak-room, lavatory, store-rooms, &c. The Art School is upon the first floor, the art class-room being 72 ft. by 25 ft., divided by movable partitions, special arrangements being made for the lighting in accordance with the requirements of the Science and Art Department. The work has been carried out by Messrs. J. B. & F. Bennett, and Mr. R. T. Orr has acted as clerk of the works. An interesting paper on the history of the Museum was read during the proceedings by Dr. Taylor, the Curator.

* See *Builder*, vol. xxxviii., pp. 735, 737.

ANCIENT CHURCHES IN BEDFORD.

ROYAL ARCHÆOLOGICAL INSTITUTE.

As mentioned by us last week, the Royal Archæological Institute has been holding its annual congress in Bedford, which has now been visited by the Institute for the first time. After the luncheon which followed the address of the President of the meeting (Mr. Magniac, M.P.), a considerable number of the visitors proceeded to St. Paul's Church, under the guidance of Mr. J. Day. After spending half an hour here a perambulation was made to the site of the Castle, through the premises of Mr. Wells, who had laid bare a considerable length of the Castle wall for the inspection of the visitors. Thence a visit was made to the "Mound,"—now the Swan bowling-green,—and then to St. Mary's Church, where the rector, Rev. Canon Brereton, acted as guide, and Mr. M. Bloxam also offered a few remarks. The next spot visited was the monastery of the Grey Friars in Priory-street. Several of the visitors also gave opinions respecting different portions of these interesting remains, after the inspection of which the company made their way to St. Peter's Church. Here Mr. St. Aubyn, the architect under whom the recent additions were made to the church, by the aid of a series of drawings, greatly interested his auditors, and under his direction inspection was made of the discoveries effected during the work. The last object in the perambulation was the old George Hotel, in the High-street.

The sectional meetings commenced directly after eight o'clock, in the Bedford Rooms, when Mr. R. S. Ferguson presided over the Antiquarian Section, and a paper was read by Mr. M. H. Bloxam on "Chaucer's Monument in Westminster Abbey." The paper was full of interesting facts, and showed that Mr. Bloxam's researches had been of a most laborious character.

Afterwards the Architectural Section met under the presidency of Mr. Bloxam, and the following paper was read by Mr. J. Day on

St. Paul's Church.

The very earliest records of a church in Bedford are to be found in Domesday Book, where it is stated that "In King Edward the Confessor's time (1041-1064) Bedford was rated at half a hundred, and it still contributes at that rate towards expeditions either by land or sea. The land of this town has never been computed by hides, except one hide which in King Edward's time belonged to the Church of St. Paul's in Alms, and it still properly so belongs; but Bishop Remigius took it away from the Alms land of St. Paul's unjustly, so the Jury say." In King Edward's time (1041) Osmund's land was worth ten shillings, and Ansfrid's three shillings; at the time of the Conquest (1066), valued at the same, and also at the compilation of Domesday (1086) the same. This evidence establishes the fact that there was a Saxon church in Bedford dedicated to St. Paul. The late Mr. Wyatt was always of opinion that there was a Saxon church here which was destroyed by fire, and he thought many of the wrought stones found in the old steeple when it was taken down in 1864 belonged to the Saxon church; he had an idea also that they retained traces of fire. It is quite certain, however, that some fragments of Norman work, no doubt portions of the arch of the north transept of the Norman church, were found; for when the work of demolition had reached within 10 ft. or 12 ft. of the ground, these stones were discovered, together with the Norman respond, which had never been taken down, but simply encased by the Early English builders with their own work. This is sufficient to prove that the Norman church was not wholly destroyed in the reign of King John. These stones are now preserved in the churchyard. In excavating the ground for the new north transept, also, the workmen came upon some of the old foundations, as they termed them, which proved to be a portion of the walling of an earlier building, and appeared to be either Saxon or very early Norman work. From the character of the moulded stones now preserved, I should think the Norman church was of considerable architectural beauty, and the date of the erection very early in the twelfth century, if not previous to that. Doubtless it was of the orthodox cruciform plan, with central tower, nave, transepts, and choir terminating with an apse. History records that it was a collegiate church, and that between 1148 and 1170 the prebendaries of St. Paul's were changed into black or regular canons and removed to Newenham, in the parish of Goldington, by Simon de Beauchamp, in accordance with the wishes of his mother Roisia, wife of Paganus de Beauchamp. Simon de Beauchamp was buried here in 1208, and the slab which covered his grave is still to be seen in the chancel of the present church. Leland says of it:—"Simon de Beauchamp lyeth afore the High Altar of St. Paul's Church in Bedeford, with this Epitaphie in bras, and set on a flat marble stone—'Under this stone lyeth Simon de Beauchamp, Founder of Newenham." This, which was the earliest known English brass, disappeared long ago. In 1878-79 the north and south walls of the church were opened up with the present arches, and a clearstory added, and in taking down the south wall, two portions of figures were discovered built in the old wall. It is conjectured one is a portion of the effigy of one of the Beauchamps, probably William de Beauchamp, to whom King Henry granted the site of the castle after its demolition. The figure was no doubt recumbent in a recess in this wall. In the history of Bedford Castle we read that in the reign of King John, A.D. 1216, the Collegate Church of St. Paul was pulled down to rebuild and fortify the castle. It is quite certain, however, that the church was not entirely demolished, but that sufficient material for the fortification having been obtained, some considerable portions of the walls were left standing, more especially the walls of the tower and other solid portions, and so most of the monuments and tombs would remain untouched through their being covered with small stones and rubbish. The church was in ruins for from eight to ten years, for we learn from the history of the castle that King Henry III., after he had reduced the castle and ordered it to be destroyed granted a portion of the old stones to the monks of Newenham for the reparation or rebuilding of St. Paul's Church. This brings us now to the history of the present building, which is the church referred to as being rebuilt in the thirteenth century after the demolition of the castle. I have no doubt it was rebuilt upon the Norman foundations; in fact, the old tower walls were not pulled down to the ground, nor scarcely any of the walls of the other parts of the church, and when rebuilt the old Norman arches of the tower were taken out by the Early English builders, the jambs cut away so as to widen the openings, the arches were then sprung from the jambs, the opening into the north transept on the north side of the tower was contracted on one side and the respond of the Norman arch built in, and it remained until this old Early English steeple was pulled down a few years ago. As I said just now, the Early English church was built on the foundations of the Norman church; at the same time also the additional nave, together with the south chancel, or what is now called the archdeacon's court, was also added to the plan. This necessitated the re-erection of the south transept to connect the south chancel with the new south nave. The old Norman north transept was not rebuilt; nearly all the walls of the present church are therefore Early English. I have reason to believe that the Norman and Early English chancels were somewhat longer than the present chancel, for one can plainly see that a portion of the piscina has really been built in with the present east end, and just above can be seen one of the corbel stones which no doubt received the jack-leg or wall piece of a former roof; this shows that the chancel must have extended beyond the line of the present east end; the windows north and south of the altar also are unusually near to the east end. Possibly the lady-chapel may have been eastward also of the high altar. I am not at all inclined to think that the Early English church was equal in any respect to the Norman church, neither do I think it was used wholly at that time nor at any subsequent period until this last restoration. The addition by the Early English builders of the south nave and chancel made a kind of a double church of it, but for what purpose this was done can only be a matter of conjecture. I should say in all probability it was built for and used as the chapel of the Trinity Brethren, one of the religious orders in Bedford at that time. From the immense length of the nave and chancel, with a central tower intervening resting upon immensely solid masonry with very low arches, I cannot imagine how the whole of the church could be used: a separate service must have been held in the chancel. From what I have seen lately, during the alterations in the chancel, I should say the south wall of the chancel was nearly all Norman work, for in carrying up the walls of the clearstory I found a considerable difference both in the thickness of the wall and quality of the masonry. I am quite certain, therefore, that in this case the Norman wall was not pulled down entirely; subsequently (probably in the latter part of the fourteenth or early in the fifteenth century) this wall was pierced with two openings, the responds and arches of which were something similar to those of the nave, the caps and bases being of a much later date. I think it was to make room for these openings that the effigy of the Beauchamps was removed and built in the wall as near to the place it was taken from as possible, as it was found in the respond of the westernmost arch. No very material alterations were made to the church in the fourteenth century beyond the insertion, in the north and south walls of the nave, of four-light windows similar to that which now remains in the north wall, together with the insertion of the south and west doorways, the rebuilding of the west end entirely, together with the strengthening of the buttresses, which, previously to the insertion of the four-light windows, were very slight. The upper stages of these Early English buttresses are now visible, those of the latter period being simply added on to the earlier ones. The north and south windows in the chancel were also inserted at the time, the chancel remaining the same length as in the Early English time. It was not until late in the fifteenth century that any further extensive alterations were made in this building, but at that time the character of the church was materially altered; the clearstory was added to the two naves, which necessitated heightening the piers and lifting the arches. The north and south porches, with the parvise over the south porch, were also added, the chancel contracted to the line of the present east end, and the vestry with the sacristan's room over was also built. The windows in the nave were filled up, and the three-light Perpendicular ones inserted, together with the two west windows. Upon a minute examination of the south porch, much interesting work may be seen. I refer to the handsome groined and canopied niches, containing figures of St. Peter and St. Paul; the detail of the embattled parapet is also very good. The doorway is the depressed four-centred arch of the fifteenth century within a square head with a hood-mould over; the west spandrel is filled in with a portcullis and the east with a shield, and what is apparently a ragged staff, which has the peculiarity of being minus the usual Bear of the Earls of Warwick. It is quite possible that Thomas de Beauchamp had something to do with the building at that time. The chancel walls and the walls of the south aisles were also raised in the fifteenth century; the chancel has the original fifteenth-century roof, which was repaired in 1848. At the same time, also, the nave roofs were entirely renewed, the figures and enrichments being all that remain of the original roofs of the two naves. At the time the clearstory was added to the chancel the roof was not taken off, but raised bodily with screw jacks, and underpinned until the proper height was attained and then releaded and made good; the present roofs of the nave are an exact copy of the original. It is worthy of notice that although the two roofs are apparently similar to each other, yet upon minute examination they will be found to differ materially, for one has tie-beams and principals alternately and the other has all tie-beams. There were some interesting old fifteenth century parcloses in the openings between the two chancels, but I am afraid these were destroyed in 1848 to make room for more modern screens. I am happy to say, however, that the old rood-screen is still in existence, although sadly mutilated, but there is enough of it left to enable one to thoroughly restore it. Mr. George Wells has kindly undertaken to store it for the churchwardens until funds can be obtained for its restoration. The stone pulpit standing at the north-east angle of the Archdeacon's Court is the ancient fifteenth-century one, and was, I believe, originally fixed against the easternmost pier of the nave arcade; Lysons speaks of it as "being ornamented with gilt tracery upon a blue ground." This is the pulpit in which John Wesley preached his celebrated sermon, "The Great Assize." The church, one can plainly see, did not escape the mutilation which took place in the Commonwealth, but suffered as much, or I may say more, than many others. In 1864,

however, the new incumbent, the Rev. W. G. Fitzgerald, found it necessary to do something towards improving the services, and an attempt was made to restore the church, a committee was formed, and subscriptions were obtained for thoroughly restoring and enlarging the church. Whilst the committee were deliberating upon the propriety of either pulling down the old church and building a new one entirely, or restoring the old one by rebuilding the steeple and otherwise enlarging the fabric, their proceedings were watched very narrowly by the general public, who felt that such an ancient landmark as St. Paul's steeple ought not to be pulled down and lost sight of for ever if it was possible to conserve it. A memorial, therefore, was drawn up, praying the committee to seek further advice before committing themselves to any scheme. This memorial was most numerously signed by the inhabitants of both town and county, and acting upon the suggestions contained therein, the committee at a subsequent meeting passed a resolution that Mr. G. E. Street should be requested to report and advise upon the matter. In his report, dated June, 1865, he states:—"The questions which arise in connexion with the restoration and enlargement of St. Paul's, Bedford, are in many respects so delicate and embarrassing that I confess to having considerable difficulty and some reluctance in reporting upon it." After advising a strictly conservative feeling in whatever was undertaken, he proceeds to say "that he never saw so long a church which was in its old state so practically useless for a large congregation; the particular division of the nave proper, being divided in the centre, produces the effect of two small churches," and he goes on to say that the only possible remedy would be some such modification of the structure as would allow of full use of the whole of the area enclosed within the external walls; this he recommends should be accomplished by the removal of the old steeple from its central position and placing it northwards; this course, although, as he states, is "attended by very weighty objections on architectural and antiquarian grounds," and the condition of the lower part of the steeple he reports as being so bad that it must ere long be either very extensively repaired or removed; he recommends, therefore, that the opportunity should then be taken to rebuild it in a more convenient position, but only on one condition, viz., "that all the wrought stones be marked, and the whole rebuilt stone for stone with no alteration of design"; the report was accompanied by a rough plan. Mr. Street felt very strongly that his advice should be taken, and if they did not concur with him he thought it would be most unfortunate if the building was touched at all; he stated that it would be best to suffer the inconvenience which our forefathers had endured for centuries, using only a portion of the old church, which he goes on to say was full of interest and architectural value, and advocated careful restoration and deprecated any departure from the old work. I have quoted largely from Mr. Street's report to show that the committee had the best advice that could be obtained, which, however, for some reason or other they did not follow, for they decided to rebuild the steeple on the old site. The result you have seen, and can best judge how far you think they have been successful.

Mr. G. Hurst at the same meeting read a paper on

St. Mary's Church.

The church of St. Mary, on the south side of the river Ouse at Bedford, is interesting on account of its high antiquity, and although portions of it have been modernised at various times, still there is sufficient remaining to show that it dates back to the Anglo-Saxon period. It formerly consisted of a nave, central tower, transepts, and a chancel. The aisles are of more recent construction; the tower is of good Norman character. It has on each side of the second stage a window of two narrow arched openings divided by a shaft, the whole enclosed within a large arch of semicircular form. On each face of the upper stage are the outlines of two small Norman lights of well-wrought ashlar, now closed, but between them Perpendicular windows of two lights have been inserted. The original plain Norman parapet has been replaced by the more modern embattlement. The north transept has long since disappeared, but the south one well merits attention, being clearly of Anglo-Saxon construction, with the exception of an arched outline similar to those in the upper stage of the tower, which was doubtless inserted when the tower was erected. With this exception, the masonry is of a much ruder character, is composed of mixed materials, and contains a considerable quantity of the green sandstone. A portion of it is of herring-bone workmanship. The presence of sandstone would indicate that it was erected with the materials of a still older building, probably Roman, as these stones must have been brought from the neighbourhood of Sandy, where the Romans had an important station, and which would not have been done had they been aware of the limestone quarries of the neighbourhood. The west end wall of the nave is original. Until the middle of the sixteenth century, opposite the west end of St. Mary's, and nearly abutting upon it, stood another church, called St. Peter's Dunstable, probably connected in some way formerly with Dunstable Priory. The site of this building was the now open space called St. Mary's-square, but it extended one-third into the present roadway, as, in laying down some gas-pipes a few years since, the eastern foundations were discovered, so the road between the two churches could scarcely be of sufficient width for more than a single cart. The services were conducted in each church on alternate weeks, and the books and ornaments removed from the one to the other. St. Peter's Church was of Early English architecture, and, accordingly, of more recent construction than the other edifice. The churchyard must have extended a considerable way westward, and have occupied a large space, now built over, as is indicated by the occasional exhumation of human bones whenever a cellar or foundation is required. After the destruction of the church, the north aisle of St. Mary's was built with part of the materials in the year 1546. The spandrels of the doorway contains, as an ornament, the carved cross-keys which distinguished the demolished church. There must have been a good deal of pinching upon the old churchyard, as is proved by the quantity of human bones discovered when any alterations have been made in the adjacent buildings. Boswell, in his picturesque views of the antiquities of England and Wales, states that the parapet of the bridge was erected in the reign of Queen Mary out of the ruins of St. Dunstan's Church which stood on the south side of the bridge. This is a corroboration of what many suppose, that the church was originally dedicated to St. Dunstan, and was subsequently re-dedicated to St. Peter on being annexed to Dunstable Priory. When the north aisle of St. Mary's was constructed, to throw it open to the church the nave wall was pierced with three arches, but being small, the parishioners had their sight obstructed, and to remedy this defect the whole of the north wall of the nave was, in the year 1840, pulled down, and the present colonnade was substituted. In the year 1853 the south aisle was added. In consequence of a rent in the south-west angle of the tower, the architect declined to pull down the whole of the nave wall, but left sufficient to serve as a buttress for its support. The western wall of the south transept from the aisle was pierced, and an arch made to correspond with that on the north aisle, thereby making a communication with the transept. A great part of the south wall of the nave had in former years been removed to insert three large Early English windows; but when the entire wall was removed to subjoin the aisle in 1853, it was found chiefly composed of herring-bone work of the native stone, and very ancient. Up to the commencement of the present century the nave had a wooden roof covered with lead. Repairs being required, the work, under churchwarden management of the period, and there being no resident incumbent, was protracted for a very long time; and the roof left partly open. The lead was appropriated by some of the managers, and the present drawing-room ceiling was constructed. According to what has been related of this transaction it was hardly creditable to some of the leading parishioners. On the south side of the altar are deposited two stone coffins of the thirteenth century, the lids even with the floor; they were found buried in some other part of the church when alterations were in progress, and were removed to this position. On the north side is another coffin of about the same date, discovered under the floor of St. Leonard's Hospital when that venerable building was taken down to make way for an extension of the North-Western railway station. This establishment was founded previously to the year 1302 by the townsmen of Bedford for "six Freres Chapleynis, wearing a religious habit," and according to Dugdale was a hospital for Lazars. The coffin was sold by auction with the old materials of the hospital, and remained for some years afterwards, with its contents, disregarded in a carpenter's yard, whose effects being afterwards sold, this, by the good taste of the auctioneer, was preserved from a second desecration, and purchased by him privately and presented to the Bedfordshire Archæological Society, who obtained permission to place it in its present position. The coffin was cut from one stone, and tapers from head to foot, with a rounded excavation for the head. A floriated cross with a circular head, but considerably mutilated, ornaments the centre of the lid. The remains contained in the coffin, when first discovered, were found to be an entire skeleton, and probably of one of the early masters of the Hospital, as with them was a pewter paten . .

The President, on behalf of the members, thanked Mr. Day and Mr. Hurst for their papers.

Dr. Goldsmith asked what special period in architecture herring-bone masonry marked.

The President.—From the Roman period up to the fourteenth century.

On Wednesday, the 27th, there was an excursion, viâ Bletchley, to Leighton Buzzard, Stukeley, Wing, Eddlesborough, and Dunstable. On Thursday there was an excursion to Cople, Sandy, and Risinghoe Castle.

Among other papers read during the week were "Recent Memorials of Bunyan," by the Rev. J. Brown, B.A.; "The Grey Friars' Priory, Bedford," by the Rev. Canon Warmoll; "The Connexion of John Bunyan with Elstow," by the Rev. J. Copner; "The Brasses of Bedfordshire," by the Rev. H. Addington; "The Earthworks of Yeldon," by the Rev. R. S. Baker; and "The Treatment of Ancient Architectural Remains," by Mr. J. T. Micklethwaite, F.S.A.

BUILDERS' MACHINERY AT THE ROYAL AGRICULTURAL SOCIETY'S SHOW, DERBY.

A NUMBER of the agricultural engineering firms exhibited saw-benches, &c. Several of these were well made, but they were almost entirely of light and crude design, and certainly cannot be compared with the productions of the engineers who make this class of machinery a speciality.

Messrs. A. H. Bateman & Co. (Limited), East Greenwich, exhibited a band-saw sharpening-machine, made by Bichon & Co., Paris. It is of ingenious construction, and should, if well handled, be of service where a number of machines are employed.

A portable balanced crane, which should be of considerable use in a timber merchant's or contractor's yard, was shown by Messrs. S. E. Ransome & Co., of London. The crane is self-contained, and is so arranged that the angle of the jib can be readily extended or diminished, as required. If the load on the jib should tend to over-balance the crane, by means of a handle and screw the radius of the jib can be lessened, till the back end of the travelling-carriage is of sufficient weight to counter-balance it. Being mounted on a pair of high wheels, it can, with a load of 10 cwt., be easily moved from place to place by one man. By extending the front of the jib-carriage framing, and curving it downwards, the crane is prevented from toppling over, even should the load be too heavy.

Messrs. Allchin & Son, of Northampton, exhibited a rack saw-bench and a band-sawing machine; these were marked at low prices, but were of crude construction. The rack saw-bench was made chiefly of wood, the centre frame of oak, and the ends of red deal. The saw-spindle was of iron, and arranged to run in conical bearings. From our experience we do not recommend this form of bearings for saw spindles, as little or nothing is gained from their use, and they are much more difficult to keep in order. The travelling-table was of pitch-pine, and fitted with a hand-power rack-feed. The main frame of the band-sawing machine was of wood, with a cast-iron column bolted to it. Altogether these machines would do credit to a settler who may have rigged them up in the backwoods of America, but they are hardly what we should look for as the products of an English engineer, and are in striking contrast to the traction engine exhibited by the same firm, which shows good design and workmanship.

Messrs. Priestman Bros., of Hull, exhibited

one of their patent steam excavators and dredgers. This was filled and discharged by one man, and being arranged with rotary and traversing motion, should be of immense service in large dock or other contracts, or in lifting sand, shingle, or grain. At this stand, too, was exhibited a capital form of patent disengaging gear for hoisting or lowering goods or discharging cargoes of almost any material; this disengaging hook is so arranged that as long as the weight bears on it the load is held, but immediately it touches the ground or vessel, the hook becomes disengaged and is immediately withdrawn by a duplicate chain. A Keatle's Patent Boiler arranged with an inserted fire-box, which formed a water space, was also shown at this stand.

Messrs. Richard Garrett & Sons, of Leiston, exhibited a portable saw-bench, specially designed for forest use, but, except that it was mounted on extra large wheels to facilitate transport, it does not possess any special feature of interest. Several compound portable engines of excellent design and workmanship were also shown at this stand.

Messrs. Aveling & Porter, of Rochester, exhibited an improved form of tipping-wagon, which appeared to be well adapted for contractors' use: it was arranged to tip sideways, and the body of the wagon was readily canted by means of a hand-wheel and spindle, which worked a pair of chains. The body of the wagon was lined with sheet iron, it being found in practice that the load will more readily leave the smooth iron surface than it will one of wood.

A considerable number of more or less well-known brickmaking-machines were exhibited by Messrs. Bradley & Craven, Abell, Pinfold, Whittaker, Fawcett, and Bennett & Sayer. The machine shown by Messrs. Bennett & Sayer, of Derby, was designed for the plastic process, and embodied in its construction several improvements, including marine type multiple collar, thrust bearing at pug end, improved internal bearing, and end knife. The steam brick-press, shown by the same makers, was fitted with a top spring box and adjustable brick die-box, for taking up near. The cutting-off table was Murray's patent.

Several engines were exhibited especially well adapted for driving sawing and wood-working machinery, where the load is often very severe, and varies constantly. In this case, to secure economy in working, especially sensitive governor gear should be employed, so that when a heavy machine, — a circular saw-bench for instance,—is thrown out of gear, the steam may be immediately controlled and prevented from entering the cylinder, and being used to waste. Messrs. E. R. & F. Turner, of Ipswich, showed engines fitted with Hartnell's Patent Automatic Expansion Governor. This form of expansion gear presents several features of interest. The principle utilised in its construction is that of centrifugal force, which, acting on a pair of weights suspended on pins, tends to throw them outwards. They are, however, governed and restrained in their action by spiral springs. The weights in flying out carry with them a quadrant or curved lever, which is arranged in such a way that it automatically acts on the slide-valve eccentric, and diminishes its stroke, thus lessening the stroke of the slide-valve, and reducing in proportion the supply of steam. Another advantage in this expansion gear is that instead of cutting off the steam by the ordinary throttle-valve, and thus diminishing its pressure before it enters the cylinder, it allows the steam to enter the cylinder at its full boiler pressure, but varies the cut-off of the stroke as the load on the engine may require, the full benefit from the expansive force of the steam being thus utilised.

Messrs. Shanks & Son, of Arbroath, exhibited a newly-designed horizontal high-pressure engine, of the girder type. It was arranged with a stroke of double the diameter of the cylinder. We may here say we are in favour of a long stroke and early cut-off for driving wood-working machinery, as ample time is given for the steam to expand, and more value is thus obtained from it. An equilibrium governor, with stop and throttle valve combined, was also fitted, and an outside bearing provided for the crank shaft. The girder framing of the engine, although strong, was, to our mind, somewhat inelegant in design.

Messrs. Ruston, Proctor, & Co., of Lincoln, exhibited a well-designed and strongly-proportioned horizontal engine, well adapted for the heavy duty of a saw-mill.

A number of stone-breaking machines were shown in operation, but most of them are too well known to need description.

A goodly array of centrifugal, rotary, direct-acting, and other pumps more or less adapted for contractors' purposes were exhibited.

Several centrifugal pumps were shown working by Messrs. Williamson, Bros., of Kendal, in conjunction with their vortex turbine water-wheel; they were of simple construction, and throw a considerable volume of water. When used for low lifts,—say not above 20 ft.—for drainage, irrigation, and such like purposes, this form of pump has much to commend it, bearing in mind its low first cost, and little liability to disarrangement.

Messrs. Evans & Co., of Wolverhampton, had a large exhibit of pumps, including a sample of their hydraulic rams, a form of pump somewhat neglected, but admirably adapted for supplying water to mansions, &c. The principle on which the ram works is that a larger volume of water having a certain fall will force, under certain conditions, a smaller volume of water to a higher point than it is itself. Very high or very low falls of water can be utilised, but both of these extremes should, if possible, be avoided, as in the case of a very high fall the friction caused by the force of the water, and consequent wear and tear on the working parts of the ram, is very great. In the case of a very low fall, the quantity of water raised is, of course, correspondingly small. The ram under notice is simply and strongly designed. The "beat," "delivery," and "snifting" valves are of gun metal, and the joints are faced.

Messrs. J. Rollins & Co., Limited, of London, exhibited several of the Douglas American hydraulic rams.

The general arrangement of the Show was excellent.

THE MARIENKAPELLE, WURZBURG.

The church called the Marienkapelle, or St. Mary's Chapel, at Wurzburg, probably because it stands upon the site of a smaller structure bearing that dedication, is a fine example of a German hall church, and offers several points worthy of study, if not of imitation.

Kugler gives 1377 as the date of the commencement of this building, which makes it the exact contemporary of the Karlshofer Church at Prague and the choir of St. Sebald, Nuremberg. Like most ancient churches, however, it appears to have been many years in course of construction. The sculpture of the doorways and the statues of the apostles round the columns were not executed until quite the end of the fifteenth century. Although both Kugler and the excellent Hand-book for the Maine, by Hänle & Spruner (Wurzburg, 1843), give the date 1377 as that of the commencement of the building, neither gives the date of its completion. As, however, it is shown in the ancient views of Wurzburg, that, for instance, in the Nuremberg Chronicle, 1482, it was certainly finished before the close of the fifteenth century, except perhaps the sculpture, which is known to have been executed by the celebrated Wurzburg sculptor, Tilman Riemenschneider.

The plan of the church is remarkably simple. It consists alone of a nave and aisles of the same height, under a single external roof. The nave is prolonged beyond the aisles, and forms a chancel. A tower and spire are attached to the north-west angle, and there is an original sacristy north of the choir. Internally the building is a vaulted hall, divided into a nave and aisles by tall and very slender octagonal piers, without capitals. Attached to the cardinal faces of the octagonal piers are corbels carrying very finely executed statues. The organ-loft is original, and is vaulted beneath. There is no ancient furniture. What at present exists is modern Gothic.

What particularly strikes one about this church is its simplicity of plan and arrangement, and the absence of anything that could cut up the design. The consequence is that although it is surrounded by houses four stories high, it looks large and impressive; in fact, it looks larger than it really is, for the whole church is only about 140 ft. long.

These "hall churches" seem to offer an excellent suggestion for ecclesiastical buildings in London and the great manufacturing towns. The pretty little Northamptonshire churches, which are over and over again reproduced in our large towns, look absurd when surrounded by immense factories or Belgravian mansions, and if Gothic architecture is to retain its hold upon the age, some much bolder and larger treatment must be found than that usually displayed in our urban churches; and it seems to us that the hall churches of Germany and the great brick single-span churches of the South of France offer suggestions as to the kind of treatment architects might do well to study.

The little shops round the Marienkapelle at Wurzburg are not, as people often suppose, a modern introduction; on the contrary, they are represented in a painting of the church executed at the very beginning of the sixteenth century. A great deal has been written about houses and shops built up against churches, and, of course, there are practical objections to the system,—danger from fire, for example,—yet there can be no doubt that many Mediæval churches were erected with the absolute understanding that they would be built up against.

The upper portion of the spire of the Marienkapelle at Wurzburg is quite modern, and not very satisfactory, though it is more or less a copy of an ancient original, i.e., St. Mary's at Eszlingen.

NEW OFFICES FOR THE LONDON AND LANCASHIRE LIFE ASSURANCE COMPANY.

The building, of which we gave a short notice on the 11th of June last,* and which we this week illustrate, is now finished. The style of the architecture is French Renaissance of an early type. The internal finishings have been carefully designed in character with the architecture, the ground-floor screens, desks, and counters being in two kinds of mahogany, with rosewood mouldings; the staircase leading from the ground-floor to the board-room on the first floor is also in mahogany. The entrance-doors are of teak, the central panels being carved with medallions symbolical of Life and Fire. The ceiling is in fibrous plaster, with rib mouldings interlacing, and fan-ribbed vaults springing from the central columns. This portion of the work was executed by Messrs. G. Jackson & Sons, of Rathbone-place. The public space is paved with mosaic. The screens on the first floor are in black walnut, those on the second floor being in grey walnut, and the upper floors pitch pine.

The offices on the upper floors are approached from Sun-court by an easy staircase of Craigleith stone. The lavatories and water-closets are lined with tiles in colours, the floors also being of the same material.

The peculiarity of the site as intersected by the gateway necessitated, to some extent, a departure from the usual practice in designing the upper portion of the front by making single columns only possible at the ends.

Mr. T. Chatfeild Clarke, of Bishopsgate-street Within, is the architect; and Messrs. Colls & Sons are the builders.

The desks and screens on the ground-floor have been executed by Mr. W. H. Lascelles; the marble mosaic is by Messrs. Burke & Co.; and the carving by Mr. F. G. Anstey, who also made the specially-designed chimney-pieces with which the fireplaces are fitted throughout.

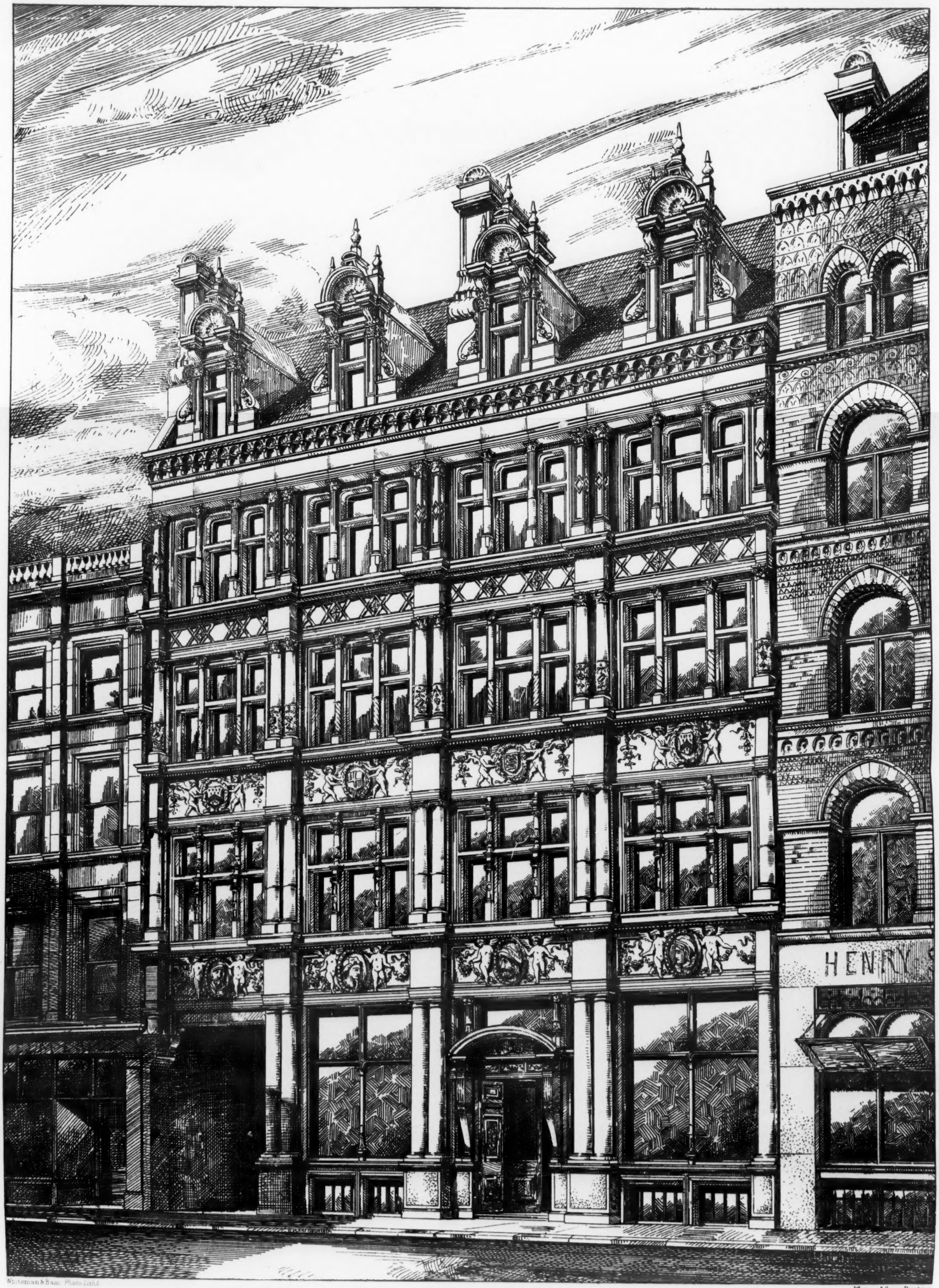
Art at the Crystal Palace.—The several scholarships and art prizes pertaining to the Ladies' Division of the Crystal Palace School of Art, Science, and Literature, have been awarded:—The Committee of Artists, Mr. H. Stacy Marks, R.A.; Mr. Alfred D. Fripp, of the R.S.P.W.C.; and Mr. W. F. Woodington, A.R.A., adjudged the silver medal for Mr. E. Goodall's pupils to Miss Mary E. Grose, of Forest-hill, for two picturesque studies in the Italian and Renaissance vestibules; and the certificate to Miss Catherine Maltilda Banks, of London, for a picture of the "Pompeian Court." Miss Beatrice A. Brown, of Honor Oak Park, who had the scholarship last year, took the certificate among Mr. F. Smallfield's students for painting from the life; and the same student obtained the certificate among Mr. O. Von Glehn's pupils for drawing from the life. The medal for drawing from the antique and from the life was gained by Miss Edith Mary Chambers, of Sydenham. For sculpture, Mrs. Cottingham, of Norwood, got the certificate; and to this lady, among the winners of the certificates, the scholarship in art for 1881-82 was adjudged.

* See vol. xl., p. 744.

Whiteman & Bass, *Photo-Litho* 236 High Holborn

Wyman & Sons, Printers, Gt Queen St.

ST. KATHARINE'S TRAINING COLLEGE, TOTTENHAM.—MR. ARTHUR W. BLOMFIELD, M.A., ARCHITECT.



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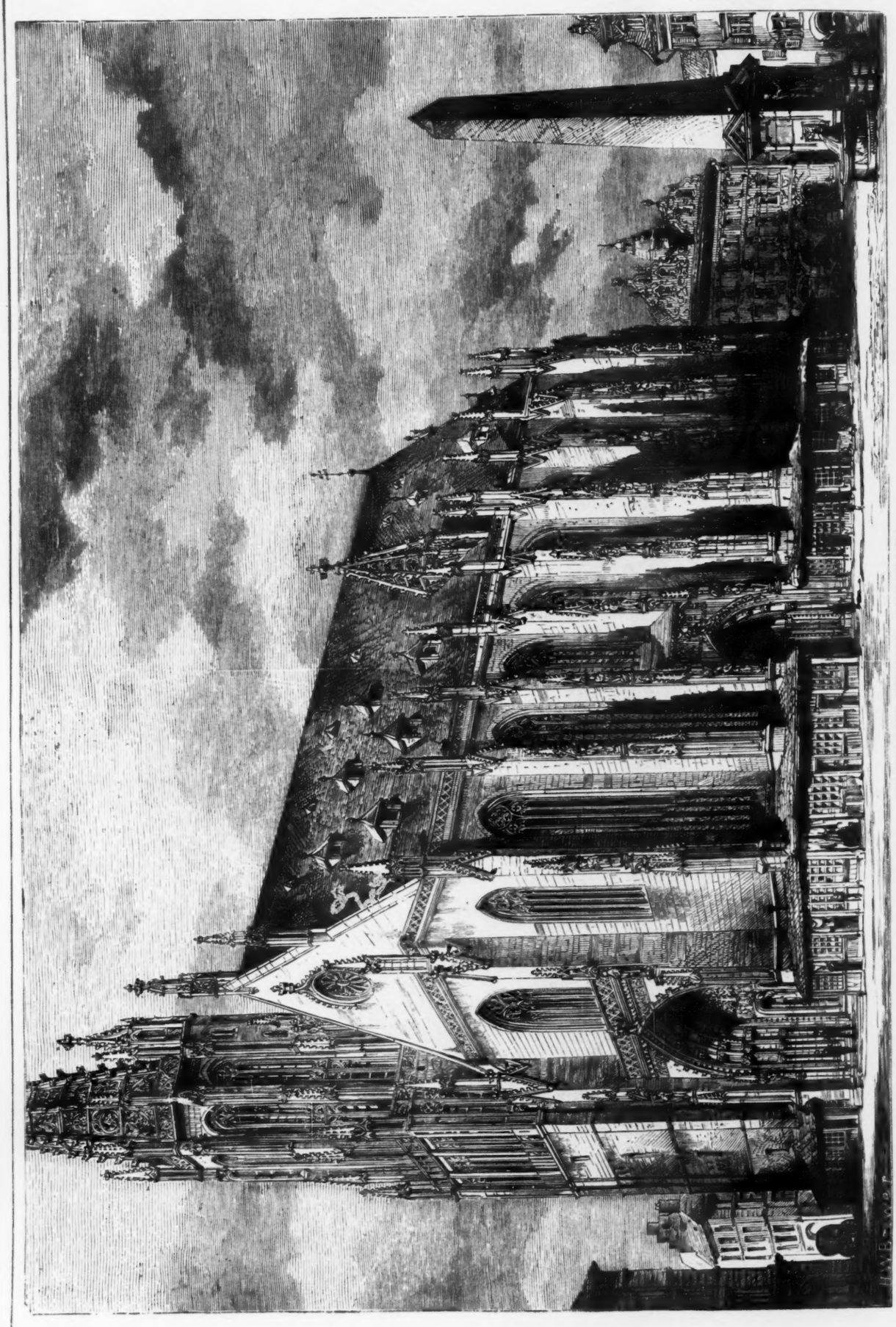
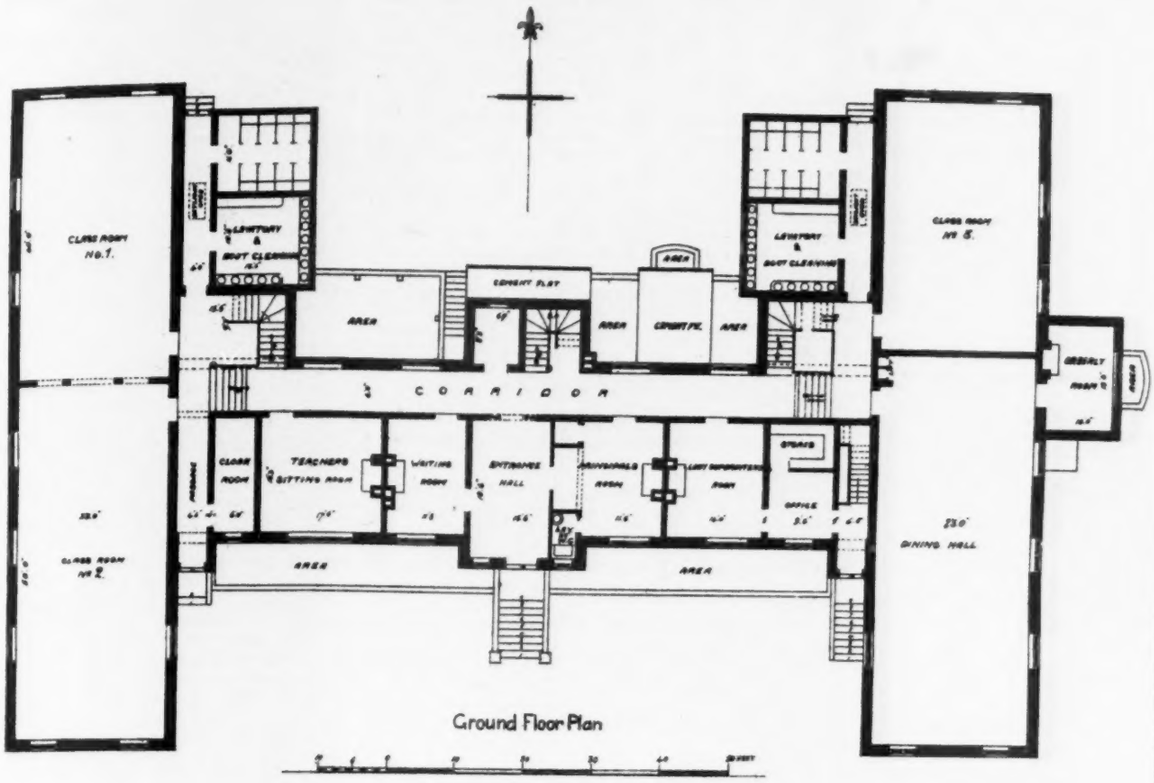
THE LONDON AND LANCASHIRE LIFE ASSURANCE COMPANY'S NEW OFFICES, CORNHILL.—Mr. T. Chatfeild Clarke, Architect.

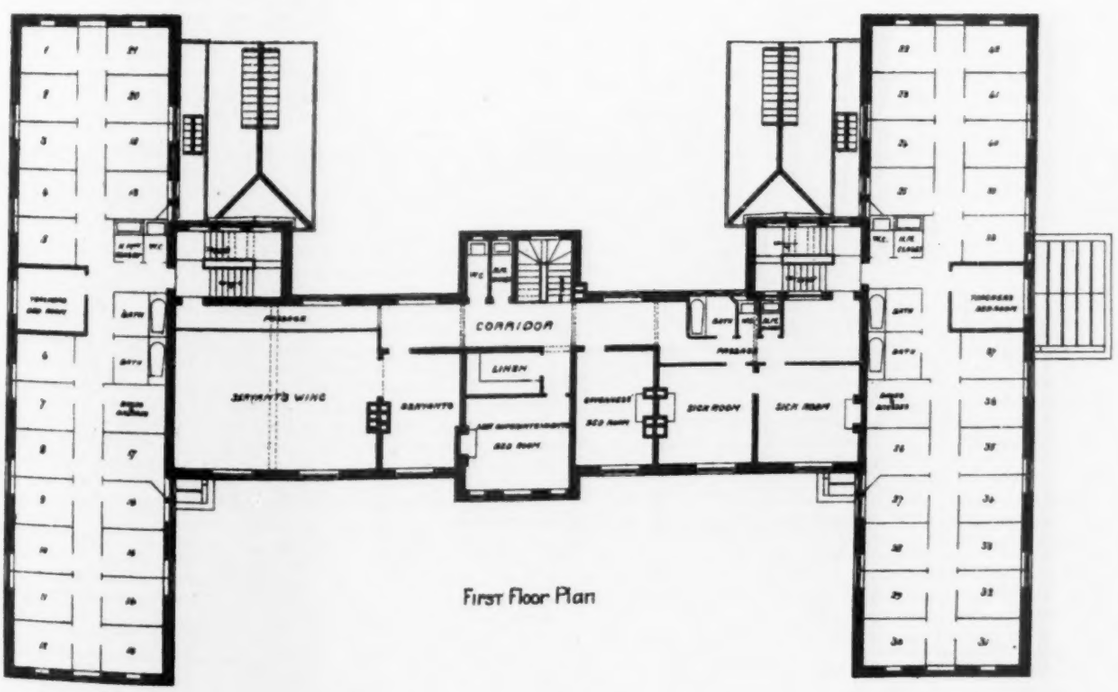


ST. MARY'S CHAPEL, WURZBURG.

STATUETTE OF MINERVA, RECENTLY FOUND IN ATHENS.



Ground Floor Plan



First Floor Plan

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ST. KATHARINE'S TRAINING COLLEGE, TOTTENHAM.

STATUETTE OF MINERVA RECENTLY FOUND IN ATHENS.

We give a view of this statuette, found a few months ago in Athens. We have already published a description of it, and commented on the misconceptions about it which at first prevailed, but may here recapitulate the chief points.

The statuette is of Pentelican marble, and, inclusive of the socle (which is 6 centimètres high), it stands 96 centimètres, or 37·79 in. high. All the archæologists of Athens agree in the opinion that, as to form, it is a diminutive copy (made probably in the first century of the Christian era) of the chryselephantine, or gold and ivory, statue of Athene, produced by Phidias for the Parthenon. On the front of the helmet there is a sphinx in repose, flanked on either side by a griffin; on the right and left of each of the griffins is an eagle's wing. The sphinx has a crest, and the griffins have smaller crests. (These details are not all shown in our view.) When the statuette was discovered, the head of the sphinx was found to have been broken off, as also had the griffins and the eagles' wings, but, with the exceptions of the griffins' heads, all the fragments were recovered. The profile is good, though the parts about the mouth are somewhat coarsely executed. On the helmet of the statuette some red lines are reported to be visible, and it is further stated that the hair, passing down from under the helmet, over the brow and on to the breast, shows traces of yellow colour, and that the eyebrows are reddish-brown and the pupils of the eyes blue,—the right eye still preserving the colour very clearly. The *chiton*, or under-robe, reaches down to the feet, while the *himation*, or outer cloak, is gathered up by a girdle that ends in two snakes' heads. Worn over the shoulders, and extending half-way down the back and bosom, is some scale armour. The back part of this shows no ornamentation, but in the centre of the front portion is a head of Medusa, showing traces of red colour. The left arm of the statuette, which appears to be somewhat disproportionately long, holds a shield which rests upon the ground. In the middle of the external face of the shield is a Medusa's head, with traces of red colour. Between the shield and the figure is a serpent, which rears its head nearly as high as the top of the shield. The serpent's head is yellow, other portions of the reptile being coloured red. The right arm of the figure, which was broken off at the elbow when found, rests on a nondescript kind of column, which was likewise broken when discovered. In the right hand is held a small winged figure of Nike (Victory) looking away from the statue. The figure of Nike has the drapery thrown over the left arm. This figure was broken into a number of pieces, all of which, however, have been recovered, except the head, for which the municipality of Athens have offered a reward of 500 francs.

Professor C. T. Newton, of the British Museum, in one of his lectures on "Greek Art in the Age of Pericles,"—the whole of which were reported by us in the early months of the present year,—referred at some length to this statuette as throwing light on Phidias's chryselephantine statue of Athene in the Parthenon, of which, he thought there could be no doubt, it was a rough copy,—a dull, cold, lifeless, Roman copy,—made for votive purposes. That the statuette was meant to be a representation of the famous work of Phidias, Mr. Newton observed, there was evidence in the writings of Pausanias, who mentioned that the left hand (*i.e.*, the same hand that supported the shield) of the chryselephantine statue held a spear. The probability was, he thought, that in the chryselephantine statue the goddess was represented as holding the spear between the thumb and forefinger of the left hand, while the remaining three fingers of the hand grasped the top edge of the shield. The disposition of the fingers of the left hand of the statuette is, as will be seen, different to that suggested by Mr. Newton as having existed in Phidias's great work. With regard to the column,—architecturally of a very debased type,—which has been introduced into the statuette as a support for the right arm of the goddess,—the arm which holds up the Victory,—Mr. Newton observed that there was no evidence given by ancient writers of the existence of any such column in connexion with the great chryselephantine statue, and, although in one or two ancient reliefs representing the statue a column was introduced to support the arm, there was, he thought, no valid ground for assuming that Phidias's great work included such a column. In his opinion, the column in the statuette was introduced with the simple view of strengthening the arm of the figure, which, being of marble, would be extremely liable to be broken off without some such support. The statuette, said Mr. Newton, was doubtless only intended to recall to the worshippers of the goddess the main features of her famous chryselephantine statue. How the arm of the latter was made, unaided by a column or some such support, to sustain the weight of the statue of Victory which she held in her hand, he was unable to say. The weight of the Victory held by the chryselephantine statue must have been considerable, and from the way in which the arm was held out, the leverage exerted must have been very great. Probably a bar of copper extended throughout the whole length of the arm of the statue.

ST. KATHARINE'S TRAINING COLLEGE FOR SCHOOL MISTRESSES, TOTTENHAM.

This institution has been established by the Society for the Promotion of Christian Knowledge, and is intended for the training of schoolmistresses for Church schools. Accommodation is provided for 100 students, a lady superintendent, governesses, and the necessary servants of the establishments.

Lecture-rooms and class-rooms are provided, and a sitting-room for the principal, who will ultimately have a residence close to the college.

Large schools for girls and infants, and a higher-grade school for girls, have been erected on the east side, connected with the main building by a covered way.

The whole of the buildings are of stock-brick, relieved with bands and string-courses of red. Lascelles's patent concrete is used in the chimney-shafts and in other positions instead of stone. The roofs are covered with Broseley tiles.

The contractors were Messrs. Dove Bros., and Mr. W. Overton was clerk of the works. Mr. A. Blomfield, M.A., was the architect.

At the last distribution of prizes, the Rev. E. Hobson (principal) dwelt on the fact that the buildings were found to admirably answer the purposes for which they were designed, and that in every department of the institution, and in almost every detail of every department, they found the requirements of the residents completely satisfied.

SANITARY PLUMBING.

SOIL-PIPE AND WASTE-PIPE CONNEXIONS, DRAIN VENTILATION, AND FLUSHING.

Mr. S. Stevens Hellyer delivered his sixth and concluding lecture* on "The Science and Art of Sanitary Plumbing," on Thursday, the 28th ult., in the Hall of the Society of Arts, Professor Henry Robinson, of King's College, in the chair. The subjects treated of were the connexions of branch pipes with main pipes and traps; waste or overflow pipes from safes; cistern wastes; disconnexion of drains from sewers and cesspools; drain ventilation; and the value of good water flushing. The lecturer commenced by observing that what he had to say might appear too full of detail, but if ever we were to arrive at perfection in sanitary plumbing, we must pay great attention to all its details. A general and roughly-carried out sanitary arrangement might do very well for temporary encampments, but places which were to be used as our homes, and the homes of our children, must have every hole and corner lighted and ventilated; every water-closet, sink, bath, and lavatory, constructed on sanitary principles; every trap self-cleansing; every waste-pipe, soil-pipe, and drain wholesome; in short, if there was to be no harbouring of filth in any part of the drainage system, it must be perfect in all its details.

Connexions of Branches with Main Pipes.—All branches, whether for conveying dirty water, soil, or sewage, should be connected to their main pipes in such a way that the discharges through them shall pass into the main pipe in the direction of its outfall, and in such a manner as not to foul any part of the pipe, be it a waste-pipe, soil-pipe, or drain, where it would not be cleansed by the flush of water following such discharges. In fixing a range of water-closets on a floor, the branches from them were often made to enter the chief branch on its upper side, and in such a manner that the discharges through any of the minor branches nearest the main stack would foul the chief branch, where it could not get cleansed again until a water-closet more remote from the main stack were used, which might not be for some hours afterwards, and perhaps not for some days. The excrement thus carried back and deposited would thus have time to dry and corrode before a flush of water was sent into the pipe from the adjoining closet to send such filth away. Therefore, all minor branches into a main branch having only a slight fall, should be made to enter at the side obliquely, and never at right angles to or on the top of the main branch. The junction should be kept well up from the bottom or bed of the main branch pipe, to prevent any matter flowing into the minor branches when travelling through the pipe. It was also an evil to continue on the chief branch pipe for ventilation above the highest of the minor branches, for the discharges from the latter would splash and flow up towards the open end of the chief branch pipe, especially if more than one water-closet was discharged at one time, and as there would be no water-traffic through that part of the main branch, it would not only become foul, but would be liable to stoppage,—at any rate, sufficiently so to prevent proper ventilation. No ventilating-pipe should be taken from a waste-pipe, soil-pipe, or drain, at a point which could be closed up by a stoppage or back-flow in the pipe,—*i.e.*, the ventilating-pipe should always be connected to the waste-pipe, soil-pipe, or drain in such a way as to make it difficult for discharges sent through such pipings to reach the mouth of the ventilating-pipe to choke it, and the connexion should be so made that if anything splashed up into the ventilating-pipe it should readily fall back, or drain itself out again. How often did one see a range of lavatory basins fitted up with the branch wastes from them entering the top of the main branch at right angles! When a basin near the main waste in such an arrangement was emptied through a minor branch into the main branch, the contents of the basin would flow both ways, and the suds would hang about the pipe and corrode upon it unless the basin farthest from the main waste were immediately used. Another evil attending such an arrangement was that there would be a constant circulation of the vitiated air in the main branch from basin to basin, and such bad air, arising from stale soapsuds and other matter adhering to the sides of the pipe, would be breathed by the persons bending over the basins to wash their hands; for in the "tip-up" basins the impure air would easily come up between the basin and the "receiver," and in plug-basins (though the plug might be in its place) the air would easily escape through the overflow arm. Another error often made in the arrangement of lavatory wastes, where a range of basins discharged into one trap, was in taking the main branch into the heel of the trap in such a way that about two-thirds of the length of the main branch always was full of water. When that was the case, how was it possible to change the "standing water" of the trap and the waste-pipe with a flush of water sent through either of the basins? The body of water standing in the trap and piping might become very offensive from the use of scented soap and the washings-down of the lavatory top, and it would prevent the waste-pipe from being cleansed, for no flush of water could be sent through the pipe with any cleansing force. When a waste-pipe from one "fitting" was branched into the trap fixed under another fitting, the connexion should be so made that no air could travel from one fitting to the other, as it easily could under arrangements sometimes adopted. If one trap must be made to receive the waste-pipes from more than one basin, sink, bath, or urinal, when fixed adjoining each other, the ends of such pipes should be taken into the trap under the normal level of the standing water. But, even that arrangement, though it might do for certain places, was imperfect in principle and faulty in detail, and therefore should never be carried out in fixing sanitary fittings near a living-room or bedroom. In dressing-rooms it was common to find the lavatory-waste connected with the bath-waste, but it was impossible to keep such arrangements absolutely sweet. When two or more waste-pipes discharge into one trap, with

* For reports of the previous lectures see the *Builder*, vol. xl., pp. 681, 711, 776; and current vol., pp. 27, 87.

their ends under the water-line, the filth carried down one pipe floated up into one or more of the other pipes, and collected and lodged there. Though the matter sent up in that way might only be small in one usage, it became large from repeated usage. The lavatory would most likely be in constant use, but the bath might not be used more than two or three times a week, and when used the discharges from it would not wash out the dried filth, for that would have collected upon the sides of the dip, and of the bath-waste, above the discharging orifice. Besides, in such arrangements, a large trap was often used, with small branch-wastes into it from the adjoining fittings, so that the trap could not get properly cleaned out by a flush of water sent into it through such pipes. In such cases, filth collected very quickly in the dip or inlet part of the trap. When, on the other hand, each fitting had its own trap, the water flushes through it could be made to cleanse every part of it, provided that the water-way from the fitting into the trap was of the same bore, and that the trap was of a self-cleansing form,—*i.e.*, a round-pipe trap.

Waste-pipes and Overflow-pipes from Water-closet and Bath Safes.—It was still the practice with many country plumbers, where they fixed safes under water-closets, to connect the waste-pipe of the safe with the water-closet trap, and to fix the pipe of too small a size to be of any value in any great overflow of the water-closet. But, supposing the pipe to be large enough to take away any overflow from the closet or leaky supply valve, its connexion with the trap of the water-closet, where the stoppage which had caused the overflow had occurred, would prevent the water getting away, and the safe would be of no good in preventing the water from overflowing and doing damage. But the chief evil in such an arrangement was that excremental matter would flow up into the safe and waste-pipe from time to time, fouling the pipe where it would have no chance of being cleaned out again, and every usage of the closet would cause a disturbance of the water standing in the pipe, and make it smell. The evil was much aggravated when the pipe was connected to the cheek or heel of the water-closet trap with its orifice partly above the level of the standing water, for soil-pipe air would then readily escape through the waste-pipe of the safe into the house. The system of fixing a separate trap under the safe, and taking the waste-pipe from it into the soil-pipe, was radically wrong, though it might, with a "weeping" pipe to charge it, be an improvement on the method last mentioned. But, in a tier of water-closets, such traps often got syphoned, and then they became inlets for bad air to the house, and might continue for hours, and even days, unsealed, and all the time the air from the soil-pipe would be escaping into the house, for the water-closet with which they were connected might not be used for days together to recharge them. The only safe way of fixing safe-wastes was to connect a 2 in. or 1½ in. lead waste-pipe to the safe, and carry it through the external wall, leaving its end open for ventilation, except where birds were likely to build in it or where the frosty air could blow through it to freeze the service-pipe to the water-closet or the water-closet itself. There was very little fear of that when the ends of such pipes faced the south, and when the service-pipes were protected; but where the ends of overflow-pipes were open to the north or north-east, the air whistled up the pipe and froze the basin water,—perhaps breaking the basin and bursting the pipe. It was, therefore, better to solder a brass or copper-hinged flap on the ends of such pipes to shut out the frost and to prevent birds building in them. When, however, such pipes could be left open, they helped to change the air in the room, with a few perforations in the water-closet seat. Of course, where that was done the space between the top of the basin and the seat must be packed with india-rubber to prevent any draught coming to the occupant; and when there was any frost in the air, a piece of board could be placed over the mouth of the overflow-pipe, but that needed personal attention. The mouth of the overflow-pipe should be enlarged and soldered to the safe, and the "outlet" end should be kept at least a foot below the level of the safe, so that the weight of the overflowing water might well open the hinged flap where the latter was used. Overflow-pipes to safes under baths or slate or galvanised iron cisterns should be treated in the same way as overflow-pipes to water-closet safes,—*i.e.*, a pipe of sufficient size to take off the supply of water to such fittings should be fixed to the safe, and carried through the external wall to discharge, with an open end outside; and, to prevent such wipes becoming inlets to the house for bad air, the ends should be kept well away from all ventilating-pipes to waste-pipes and drains, and from places where any bad air could reach them. Where stop-cocks were used for supplying a bath with water, or where any supply-valve by leaking dropped its water into a safe, provision should be made in the connexion of the bath-waste with the safe for taking off such leakage, for if it were allowed to run down the overflow-pipe in frosty weather, the word "safe" would be a misnomer, for the dropping water would freeze up the outlet of the overflow-pipe, and then, if an overflow took place, it would soon flow over the safe on to the ceiling.

Cistern Wastes.—Waste-pipes from cisterns should never be connected with any other kind of pipe. As described for overflow-pipes from cistern safes, waste or overflow-pipes from cisterns should discharge into the open air, well away from all places where any impure air could reach them, for when they discharged over a gully or any other drain trap, they acted as air-pipes from such traps. Any drain air passing through the trap (caused by the water in the trap having evaporated or by the disturbing action of discharges into the trap) would pass through the waste or overflow pipe to the water in the cistern, and contaminate it. It was also a great evil to discharge a waste or overflow pipe from a cistern into a rainwater-pipe with which might be connected a sink or lavatory waste, for such rainwater-pipe was sure in time to become foul, and the bad air arising from it would readily escape through the cistern-waste to the water in the cistern. It was all very well to blame water companies for not supplying pure water, but when no great trouble was taken for keeping the water pure,—should it ever come into the cisterns pure,—we could not very well be angry with the water companies. The other day he was called in to examine the sanitary arrangements of a house which had recently been overhauled and reconstructed. He found about four-fifths of the work well done, but among one or two things imperfectly done was a cistern-waste. The pipe had been disconnected from the watercloset-trap and continued and made to discharge over a rainwater head. The cistern itself was on the attic-floor, and placed in a corner of the servant's bed-room. He was not then considering the position of cisterns, so he would say nothing about that, except that the water stored in such a quarter must get contaminated. The waste-pipe acted also as an overflow-pipe, and being thus open at both ends, there was nothing to prevent the foul air from the four or five lengths of rainwater pipe over which the waste-pipe discharged, passing to the water in the cistern. The combined sink-waste and rainwater-pipe emptied itself into a large gully-trap in the back area of the house, and as such traps, as was shown in a previous lecture, were non-cleansing, every time the water was disturbed a bad smell was emitted, which partly escaped through the window just over the trap into the house, and partly found its way up the four or five lengths of foul waste-piping, and thence through the cistern-waste, to contaminate the water in the cistern and the air in the servant's bedroom. A branch waste from a sink on the third floor was taken into the combined sink-waste and rainwater-pipe, but the branch was trapped, showing that the plumber or director of the work had an idea of such piping becoming foul; but the mystery was why he carried such a pipe as a cistern-waste into it. Cistern-wastes, he repeated, should discharge themselves well away from all traps and ventilating-pipes. When they could not be made to discharge into a roof-gutter, or on to a flat or yard, and when the only place that could be found was a rainwater-head, the standing pipe in the cistern should be treated as a plug, by soldering over its top, and an overflow-pipe to the cistern should be fixed to the cistern as described for the cistern-safe, care being taken that such pipe was of sufficient size to take off the full supply of water to the cistern. If the workman erred in this matter he should err on the side of largeness.

Disconnexion of Drains from Sewers and Cesspools, and Drain Ventilation.—No drain was properly connected with the sewer (or cesspool, as the case might be) which would allow the sewer or cesspool air to get into the drain unless it was very largely mixed with the atmosphere. Every drain should be trapped off from the sewer by an efficient and self-cleansing trap, and, immediately on the house-side of such trap an air induct pipe should be fixed to the drain; or, better still, if circumstances would admit of it, a large air-shaft should be built from the bed of the drain to the surface-lead of the ground, for the upper part of the drain at such point to be well open to the air. Where the drainage of the house had been carried out on the principles laid down in these lectures, there was no risk in opening a well-ventilated drain to the air, provided the trap used for such purposes was a self-cleansing one, having a good water-seal (to allow for evaporation), and provided, also, that it was only of such a size as to admit of the whole of its standing water being changed by a flush of water sent through the drain. But to fix such an arrangement—say, for instance, in the area of a London house,—and to connect it to an old brick drain, saturated with sewage matter, and of such a size that no amount of water that could be sent into it would flush it; or to fix it even to a pipe-drain too large to be flushed out, and, therefore, too large to be kept wholesome, was to run a great risk of getting intolerable stinks at such openings. It required good experience in such matters to treat open drains successfully; but to fix a 9 in. trap where a 6 in. would be ample, or to fix a 6 in. where a 4 in. would suffice, was to run a risk of getting bad smells into the house if the latter was near such openings, for the contents of the trap would under such circumstances only rarely be entirely changed. Where the outlet end of the drain into such traps could not be left open to the atmosphere,—for various reasons, as, for instance, being an old drain which could not be properly flushed out, or because the opening would come directly under or near a window, or close to an opening into the house, or under a covered way where any bad air emitted from the trap or drain would get pent up, to enter the house directly a window or door near the place was opened,—then, in such cases, the opening over the top of the air-shaft or trap should be sealed up, and an air-induct pipe taken into it for the admission of fresh air into the drain from a point well removed from the house. Where the end of such induct-pipe could not be kept well away from the windows, doors, or passenger traffic, a mica-valve should be fixed over its mouth to prevent, as much as possible, any drain-air escaping through it; or, the induct-pipe could go up to the roof, but in the latter case the pipe should be kept lower than the up-cast pipe of the drain, so as to obtain better results from it. Though the plumber might have nothing to do with fixing such a trap for disconnecting the drain from the sewer, he had generally to do with the ventilating pipes of the drain, for in most cases he was called upon to fix them, especially when they were of lead; and as no drain was properly ventilated unless the air in it was changed, and as that could not be done without an inlet as well as an outlet, the plumber's knowledge of drainage matters ought to extend as far as the sewer. Not that he should be required to plan the drainage of a house, but his knowledge of sanitary matters should be such as to lead him to carry out every part of his work in an intelligent manner. If sewer air were allowed to pass freely into the drain, the whole atmosphere surrounding the upper portion of the house,—where the plumber terminated the ventilating-pipes of the drain,—would become contaminated, and such vitiated air would often get sucked into the house. If such smells were sufficiently pronounced to call special attention to them, they might get set down to imperfect plumbing; at any rate, there would not be great wisdom in making the plumbing sanitarily perfect, and leaving the drains imperfect, for if a man was to be made ill by breathing polluted air, it might as well come from defective plumbing as from defective drainage. He supposed that at the present time the larger proportion of the house drains of the United Kingdom were unventilated, and the other portion only imperfectly ventilated. In the scheme of house drainage of which he exhibited a model, he had disconnected each stack of soil and waste pipe, thereby localising each of them; and that each pipe, as well as the drain, might be perfectly ventilated, he had given each its own inlet and outlet; in fact, he had treated them in the model as they ought to be treated in practice so as to secure

a perfect ventilation throughout the whole system. In fixing ventilating-pipes for upcasts to drains, care should be taken to keep them well above and well out of the way of all openings into the house, as explained under the head of soil-pipe ventilation in the previous lecture, so that the bad air coming out of such pipes might not get into a house through a chimney, skylight, dormer-window, or any other opening. It would really be amusing, were it not for the serious consequences likely to arise, to take note of the ill-considered positions in which such pipes were terminated. Sometimes they were seen placed where no wind could reach them at all; at other times they were left so that the smallest wind might blow the air emitted from them right into a window; and in other places, by crossing and re-crossing the roof, they were carried up some tall chimney-stack and terminated at a point so situated that the slightest downward pressure of the atmosphere pressed the bad air from such pipes down the chimneys into sleeping or other apartments! No ventilating-pipe from a drain should be fixed inside a house if it was at all practicable to fix it outside. To prevent the possibility of drain-air escaping into a house from a ventilating-pipe through a leaky joint, broken pipe, nail-hole, or any other defect, such pipes should be fixed outside the house. When such pipes were of lead, and were wanted to stand for a century or centuries, as leaden rain-water pipes would, they should be kept out of the power of the sun as much as possible, for with soldered joints the pipe would have no freedom for expansion or contraction, as in leaden rain-water pipes with slip socket joints.

Value of Good Water-Flushing. — If water carriage was to be the system of removal, water must be used freely. If the slops and sullage of a house were to be effectually removed, whatever else might be limited in a house, water must not be. To make water the cleansing power of waste-pipes, soil-pipes, and drains, and then to limit its use, would be to leave the filth lodging, decomposing, and corroding in the pipes. How we should ridicule a vestry board which sent a street scavenger to clean Regent-street, say, with one sweep of his broom, to begin at one end and push it right through the centre of the street to the other end. And yet such a swept track as that represented the treatment a soil-pipe often got. The pipe was befouled all over by an offensive excremental discharge sent into it, but the water used for washing out the pipe was only sufficient, in many cases, to cleanse a channel down its sides. A pailful of slops, collected from chamber utensils, was thrown down a water-closet in a body sufficiently large to foul the whole of the soil-pipe belonging to the closet, and, at the same time, a water-waste preventing valve was opened for two gallons of water to pass into the closet to cleanse it; but the water, squirting into the water-closet as if it came from a boy's syringe, was of little value for cleansing the pipe, as it did not cover the whole of the parts fouled, and the parts unwashed became coated over with excremental matter, corroding up the pipe and making it unwholesome. The real cause of pipes stopping up was the want of good water flushing. It would be possible to stop up a 6-in. pipe to a water-closet or urinal with a bad supply of water to it, quicker than a 3½-in. one with a good supply of water. No waste-pipe, soil-pipe, or drain could be kept wholesome unless adequate flushes of water were sent through it immediately after discharging dirty water or excremental matter into it; and before such discharges were sent through the traps they ought to be largely diluted with water, — especially in such cases as the contents from chamber-utensils. Measure water into slop-sinks and water-closets by the table-spoonful, and whatever else might be clean and wholesome about the house, such fittings with their belongings would not be. He knew that it was possible to utilise two gallons of water, — the quantity allowed for water-closets by the London water companies in accordance with the Metropolis Water Act of 1871,—in such a way that it should pass into a closet with greater cleansing power than twice that quantity badly supplied, but that was not the point now in question. He contended that two gallons of water were insufficient for keeping a water-closet and its belongings wholesome, and he was speaking to a body of practical men whose opinion on the matter he should be glad to hear. Were there ten men in the room who considered a two-gallon water-flush sufficient to cleanse a water-closet, basin, trap, soil-pipe, and drain after usage? ("No.") They must knock at the door of Parliament, and send in a message stating that a large body of practical plumbers found from experience that two gallons of water were insufficient to keep a "house of commons" wholesome, and that, if more water could not be allowed, such places must be abolished. Even when plenty of water could be had, however, the flush was often interfered with by bad appliances. The supply-valves, instead of being equal to flushing-out a 4 in. or 4½ in. soil-pipe, were often only of sufficient size to cleanse a 1¼ in. or 1½ in. pipe; or perhaps the boiler-screw or cistern connexion was of smaller diameter than the service-pipe, and the water was, so to speak, "wire-drawn" through it. Having called attention to Mr. Rogers Field's flushing-tank as a valuable means of flushing-out the drains of a house automatically, the lecturer went on to say that the question of flushing was a very important one, for though ventilating-pipes from drains and soil-pipes might be carried up above the roof, the stink coming from them, where the drainage pipes were not thoroughly flushed, would be so great that the whole of the atmosphere surrounding our dwellings would at times become largely charged with the bad air emitted from such pipes, and though such bad air would no doubt get largely diluted before it was breathed, in great cities,—at any rate, in a huge city like London,—it would pass at times pretty freely into houses. When the drainage of London houses was properly ventilated,—*i.e.*, when every waste-pipe, soil-pipe, and drain had its ventilating-pipe, the number of such pipes would be enormous,—hundreds of thousands. How important, therefore, was it that the stink coming out of such pipes should be minimised by efficient flushing. Having dwelt on some other points, including the supply of water to urinals, the arrest of grease before it passed into the drains, precautions to be taken against pipe-freezing, the storage of water (recommending, by preference, slate cisterns for water intended for dietetic and potable purposes), and the construction and finishing of water-closet rooms, the lecturer made the following observations as to a

Suggested Code of Rules for House Sanitation. —Various opinions were now before the public as to the best method of draining a house. Several had been referred to during the lectures, and he would simply say, in concluding his remarks on "the science and art of sanitary plumbing," that it was about time that the opinions of sanitarians on such matters should be consolidated. The principles of house drainage were so far determined upon that there ought to be no great difficulty in framing a good sanitary code as a general basis to work from. He would have the boundary lines of such a code marked out with silken cords rather than with iron bands; for, like all new things, sanitary knowledge should have room to grow. He believed it would be just as easy for a tailor to make a suit of clothes to suit all climates as it would be to lay down a code of sanitary rules to suit all cases. If he had to draw up such a code of rules he should make them read somewhat as follows, viz.:—

1. That pure water shall be supplied to every house for dietetic purposes, and where this water cannot be drawn direct from a constant supply, it shall be stored in cisterns easily accessible for cleansing purposes; and such cisterns shall be so placed that no vitiated air can reach them, either from the house, water-closets, or ventilating-pipes,—from waste-pipes, soil-pipes, or drains.

2. That no draw-off cock to any sink or "fitting," other than a water-closet, shall be supplied from a cistern fitted in a water-closet, or standing in a place where any contaminated air can reach it, or from a cistern or service-pipe which also supplies a water-closet.

3. That every drain shall be trapped off from the sewer by a self-cleansing intercepting sewer trap, fixed in every case outside the house; and where the mouths or inlets of such traps cannot be left open to the atmosphere, air-induct pipes should be taken into the drain immediately on the house side of such traps.

4. No drain shall enter the walls of a detached or semi-detached house.

5. In a line of houses, as in terraces and streets, where it is impossible for the drain to reach the soil-pipes without coming inside the house, such drain shall be of cast-iron, heavy water-main strength, and this pipe shall be "Barffed" or coated with solution, and laid in a brick trench, or fixed on the face of the basement walls, and its joints well caulked with lead. The drain shall be so ventilated that not a foot of it shall be without a free circulation of air through it.

6. Every drain from a house shall be so ventilated that no stagnant air shall remain in any part of it; and where this cannot be done by air-shafts, ventilating-pipes shall be fixed, and the drain divided into sections, and its branch drains, when of great lengths, localised, so as to ensure ventilation in the entire system of drainage.

7. All soil-pipes, where practicable, shall be fixed outside the house, with their discharging ends exposed to the atmosphere,—either directly by emptying into open traps, or indirectly by foot ventilation; and such pipes shall be carried up to the highest points of the roof full size, for proper ventilation, having their terminals well removed from all openings into the roof or house.

8. All dirty-water wastes from sinks, baths, lavatories, &c., shall discharge themselves with open ends into intercepting traps fixed outside the house, and such pipes shall be continued up through the roof full size for ventilation.

9. All clean-water wastes,—from cisterns, cistern-safes, &c., shall be kept separate from other wastes, and shall discharge with open ends into the atmosphere, well away from all drain traps or places where any bad air can reach them.

10. All wastes or overflow-pipes from safes under water-closets, baths, &c., shall be kept separate from other waste-pipes, and shall be made to discharge in the open air.

11. Every sanitary "fitting" fixed inside a house where foul matter, or contaminated water, is passed into it, or from it, shall have its waste-pipe trapped off from the house, and such trapping shall be made immediately under such "fitting."

12. All traps fixed inside the house shall be self-cleansing; and no trap which fouls itself or is not easily flushed out shall be used on the drainage outside the house.

13. All traps to water-closets, slop-sinks, sinks, baths, lavatories, &c., which can have their water syphoned out by the use of any fitting upon a pipe in connexion with them, or by the use of themselves, shall be ventilated, to prevent such syphonage, and also to allow of the branch pipes being ventilated.

14. No sanitary fitting shall be fixed which will not allow a good flush of water to be sent through it to cleanse it and its belongings, to prevent any pipe from it,—be it a waste-pipe, soil-pipe, or drain,—from getting unwholesome.

15. Every house shall be provided with proper and efficient means for flushing-out the whole of its drainage.

16. The walls inside water-closet seats, the floor, and the walls of water-closets, should be made air-tight to prevent any odours in them passing to any room adjoining through a crevice, crack, or opening.

17. The rooms of water-closets should be well ventilated, so that a constant change of air may take place in them.

In conclusion, Mr. Hellyer observed that whatever charge might be laid against journeymen plumbers, want of interest in their trade could not be alleged against them, for he questioned if the members of any other branch of the great building trades would have come out night after night, during the hot time of summer, to listen to dry lectures. Lying in their strong arms, slumbering in their hardened muscles, resting in their well-trained fingers and educated hands, was, in a large measure, the health of this leviathan city. The plumber's part in making a house, a town, a city, healthy, was enormous. He believed that if plumbing work was done on the principles laid down in his lectures, this huge city, teeming though it was with human beings, would become the healthiest, as it was now the greatest, city in the world. Let the plumbers of to-day seek to do their work in the very best way possible, so that their successors in a future age might say,—"How well the plumbers of the latter part of the nineteenth century did their work!"

The chairman addressed a few observations to the meeting. He said he considered Mr. Hellyer's lectures to be of the greatest possible value and interest, not only to the craftsmen of the plumbing trade, but to the public at large. Those who had watched the progress of sanitary reform knew that it was only by repeated efforts that reforms were initiated and the apathy of the people with regard to them aroused. He thoroughly endorsed what Mr. Hellyer had said as to the necessity of knocking at the door of Parliament, and he, for his own part, had urged the appointment of a responsible Minister of Health. Health was of at least as much importance as trade and other matters which engrossed the attention of separate Ministers. During the last few years the importance of house sanitation had been increasingly recognised, and he thought the time had come when legislation on matters of health should, on all vital points, cease to be permissive. In America, where great attention had been paid to the subject of late, a Bill had been passed, called the Plumbers' Bill, making it penal for any work of a sanitary nature in a house to be done badly. He thought a similar measure was much needed in England (loud cries of "No, no," from one or two persons in the meeting). He was sorry if he had trodden upon anybody's corns, but such was his opinion. In conclusion, the chairman announced that the National Health Society had arranged to hold a meeting for the discussion of Mr. Hellyer's lectures on Monday, August 15, when Mr. Ernest Hart is expected to preside. It is desired that all who may wish to take part in the discussion should send their names to the secretary of the society, No. 44, Berners-street, W.

A vote of thanks to Mr. Hellyer for his lectures concluded the proceedings.

The lecture was repeated on Friday, the 29th ult., Mr. H. H. Collins, F.R.I.B.A., in the chair.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

The annual meeting of this association has been held this year at Chepstow.

The Rev. W. Bazeley read the report of the Council. There were at present 433 annual members and seventy-two life members, giving a total of 505 members. During the past year thirty-three new members had been elected, whilst the society had lost twenty-two members by death or resignation. The income of the society, including last year's balance, amounted to 240*l.* 12*s.* 2*d.* The expenditure amounted to 126*l.* 13*s.* 7*d.*, leaving a balance of 113*l.* 18*s.* 7*d.* Besides this balance the society had a funded balance of 412*l.* The report referred with regret to the death of the late Professor Rolleston, who had rendered great assistance to the society, and then related the proceedings of the year. The council recommended the re-election of the various officers, with the following additions or alterations:—Mr. W. C. Lucy, vice-president (Gloucester); Mr. W. Leigh, vice-president (Stroud); Mr. H. Deane, local secretary for Stroud district; and the Rev. A. Loxley, local secretary for Fairford. The council had to report the resignation of their treasurer, Mr. Christopher Thomas, through pressure of other engagements. The council had reluctantly accepted his resignation, and had expressed to him its cordial thanks for the services he had rendered to the society, and for the interest which he continued to take in its welfare. It had also requested him to accept the office of vice-president at Bristol, now vacant. Mr. Gillet, of Gloucester, was nominated as treasurer, in the place of Mr. Thomas. The following members of the council retired, but were eligible for re-election:—Sir John Maclean, Rev. Dr. Caldicott, Rev. Prebendary Scarth, and Messrs. Adlam, Crawshay, and Lang.

On the motion of Mr. W. J. Stanton, M.P., seconded by the Rev. J. B. Green, the report was adopted.

The Rev. Fielding Palmer proposed, and Major Cowburn seconded, the re-election of the members of the Council, which was carried unanimously.

On the motion of Sir Wm. Guise, a vote of thanks was passed to the outgoing president.

Mr. J. E. Dorington thanked the members, and introduced his successor, Sir John Maclean, who was received with applause.

Sir John Maclean then delivered his inaugural address. He referred to the interest attaching to the study of archæology, and to the fact that it was becoming more and more popular. The study of archæology might be divided into two eras, the pre-historic and the historic. The former was divided into three periods, known as—first, the stone age; second, the bronze age; and third, the iron age. He then alluded to the discoveries made in the last thirty years in the elucidation of the history, the state of art, and the degree of culture of the ancient empires, especially to the discoveries of Layard, Rawlinson, Smith, Wood, Schliemann, and others. He afterwards referred to the ancient remains of our own country. Gloucester was particularly rich in them. The long barrows almost wholly found on the Cotteswold hills showed that these high lands were somewhat thickly populated at a very early period. He also gave some interesting particulars concerning the Forest of Dean. He was not aware that it contained any pre-historic remains of a definite character. That the Romans occupied the district between the Severn and the Wye was clearly established by the roads by which the district was traversed, by the coins and other articles found in the old iron workings and elsewhere, and by the remarkable remains which still existed at Lydney Park. He dwelt upon the importance of the greatest care being exercised in the restoration of our ancient parish churches, adding that the manner in which some of them had been "restored" made one sick at heart.

After luncheon at the Beaufort Arms Hotel, the members repaired to Chepstow Castle, where Mr. G. T. Clark, of Dowlais, gave an interesting description of its history. Chepstow Church was also inspected, and afterwards there was a carriage excursion to Beachley and Sedbury-park, at the latter place Offa's Dyke being inspected and the president making some remarks upon it. After this the members partook of tea at the residence of Mr. S. S. Marling. Returning to Chepstow, they dined together at the Beaufort Arms.

The members met in the evening at the hotel, under the presidency of Sir John Maclean, who read some "Notes on a Hiding-place found at English Bicknor." He said that in the week preceding Christmas, 1880, some men, whilst levelling down a rocky bank in a steep field on the glebe at English Bicknor, discovered a cavern, which had evidently been fitted up with considerable care as a place of concealment. It was oval in form, 6 ft. high, 6 ft. in length, and 4 ft. or 5 ft. in breadth. The entrance was low and narrow, allowing just sufficient room for a man to creep in. The cave was quite concealed, and it was evidently a carefully-prepared place of retreat. A number of relics were found. It was supposed that they were of the date of Charles I., and that the cave was the hiding-place of some unfortunate Royalist in the time of the Civil War.

The Rev. W. Bazeley (one of the general secretaries) read a paper contributed by the Right Rev. E. Twells, D.D., on "The Cistercian Order."

The Rev. John James followed with a paper describing a leaden tablet lent by Mr. Charles Bathurst, of Lydney Park, for the temporary local museum of the present meeting. The speaker, reading and translating the Latin inscription on the tablet, said it was one of the most curious of the Anglo-Roman remains which had been discovered on the heights of Lydney camp. The ring to which it referred had been recovered and identified at Silchester.

The Rev. R. Hall read a paper on "Local Names in the Forest District."

Sir William Guise being appealed to to make some remarks on the paper, said there was no subject so full of pitfalls as nomenclature, and none into which philosophers tumbled head over heels so soon as nomenclature, and he declined to follow them.

On the second day, a large party assembled at the Beaufort Arms Hotel in order to proceed to various places of interest in the locality. Breaks and carriages were provided, and about eighty ladies and gentlemen joined in the excursion. The party proceeded *viâ* Tidenham Chase,—a most picturesque bit of country,—to St. Briavels. Here a stoppage was made, and under the guidance of the Rev. W. T. Allen, they inspected the church and castle. The church is a handsome structure, and immediately opposite it are the remains of the castle. The annals of Giraldus state that the Castle of St. Briavels was built in the reign of Henry I. (1100–1135) by Milo-Fitz-Walter, Earl of Hereford, to check the inroads of the Welsh,—who were particularly active in harassing their neighbours in those days,—and to confirm the authority of the Norman kings in this region. Houses have been built round close up to the edge of the old moat. A bit of the latter still remains, the pent stock and *batardeau* forming a roadside pool by the gateway. It is fed by two natural springs from the high ground above. The castle stands, or rather did stand, on a sharp shoulder, not on the summit of the hill. It is built of the Old Red Sandstone brought from the common, which is distant about a mile. The double tower of the gateway entrance is still inhabited, but the remainder of the building is in ruins, and unless something is done to preserve them the walls will very soon be level with the ground. There is a fine old kitchen on the right, inside the gate. The chimney is 9 ft. wide, and there is an iron plate there bearing the arms of Elizabeth. The walls are 9 ft. thick. The original dog-wheel, inside which the dogs ran to turn the spit, still remains. The roof of the twin tower is no longer weather-proof, and its few remaining rooms will soon cease to be habitable; the tower itself will soon rank with the things that have been unless speedily cared for. Having spent a pleasant hour here the party proceeded to Tintern, stopping for a brief period at St. Margaret's Grove in order to inspect a portion of Offa's Dyke. Tintern was reached about half-past one, and the excursionists paid a visit to the abbey. Thanks to the care bestowed upon it by the Duke of Beaufort, the remains are more carefully preserved than is the case with most of these ancient monuments. Mr. T. Blowhill gave an interesting description of the venerable pile. On the return journey to Chepstow, the party visited Piercefield Park, and were entertained to tea by Mrs. Clay.

At the evening *conversazione*, Mr. W. C. Heane contributed a paper on "The Grange in the parish of Flaxley." He said the Grange estate, and a farm adjoining it called Saint White's, were parcels of the possessions of Flaxley Abbey. They were in the parish of Flaxley, but formed an outlying part of it, being separated from the mother parish by the parish of Littledean and part of the Forest. The Grange itself was a three-storied house of Tudor, or, perhaps, Jacobean, architecture. Nowhere on its walls could a date be seen, nor had he found any mention of the building of it. It gave one the idea of not having been completed, but as if it had been intended to build the house to form three sides of a square with a quadrangle in the rear, and that the third side or wing was never built. There was a tradition that part of the house was burnt down, but he could find no evidence of this. It was fast becoming a ruin, as no care had been taken to keep the roof in repair. In 1866, when his father left it, a few hundred pounds would have put the old place in perfect repair, but that was not done.

Mr. T. Henry Middleton contributed "Notes on the Church of Mitcheldean." No part of the existing church, with the exception of the font, appeared to be earlier than the beginning of the fourteenth century. The earlier portion, which belongs to the Decorated period, consists of a somewhat narrow nave, with a south aisle, at the west end of which stands a tower and spire, and opening into the tower on the south side there is a small porch. On the north there were originally two Decorated aisles, but the northernmost of these was rebuilt during the Perpendicular period, probably to gain increased width, when Robert Gryndour founded his chantry here. The eastern part of the chancel is modern, and a vestry has been added to the north-east. A number of modern windows have been inserted of various styles, in some cases not in accordance with the date of the work around them. On the whole, the church is a fine and interesting one, in spite of the loss of its fittings and the thorough "restoration" it has undergone. The earliest feature of the former church is the font, which is Norman, and tub-shaped. The upper half has been lost, and the remaining half is turned upside down, and has the basin cut in what should be the base.

Mrs. Bagnall Oakeley contributed a paper "On some Roman Coins found in the Forest of Dean," and the President read a paper on the "Outlines of the History of the Manors and Advowsons of Mitcheldean and Abbenhall."

The concluding meeting was held on the morning of the third day, at the Beaufort Arms Hotel, the President, Sir John Maclean, in the chair.

Sir Wm. Guise proposed that the next annual meeting be held at Stow-on-the-Wold, and that the selection of the President be left to the Council. He said the district he had named had lately been opened up by railway communication, and he believed that there was less known of that portion of the Cotswolds than of any other part, although it embraced one of the most interesting and beautiful parts of Gloucestershire.

Mr. J. F. Nicholls seconded the motion, and remarked that it was a corner of the county of which very little was known, so that it would be very interesting to go there.

The motion was carried *nem. con.*

Mr. Gambier Parry proposed a vote of thanks to the President. He said they all deeply felt the sudden loss of Mr. Granville Somerset, who was to have taken the chair at that meeting, for those who knew him entertained respect, affection, and even reverence for him. They were greatly indebted to Sir John Maclean for accepting the post, and for the ready and efficient support he had given to the society.

The President, in reply, said it was very gratifying to find that his labours had met with their approbation, but the success of the association was more particularly due to the President of the Council, to whom he proposed a vote of thanks.

Sir William Guise, in reply, said he took great interest in the society from the beginning, and it was with great satisfaction and pride that he saw the position they had achieved. He concluded by proposing a vote of thanks to Mr. Palmer Hallett and the Rev. W. Bazeley, the general secretaries, who replied.

At half-past ten the members started on an excursion to Lydney and the Forest of Dean. Some of them journeyed to Lydney Park by road, conveyances being provided for them, whilst the greater number proceeded by rail to Lydney Junction. Here they alighted, and were met by Mr. Lamb, who acted as guide. They first visited the parish church, a fine old building in the Early English style, with chancel, nave,

and aisles, and a square tower, with a finely-proportioned steeple. There are many interesting archæological features in the church. Passing through the village,—or, perhaps, it ought to be termed a town,—the cross in the centre of the cross roads was noted. From the top of the pyramid of steps on which the cross rests the priests in the old time used to preach. The party then proceeded to Lydney Park, the seat of Mr. Charles Bathurst, where the Rev. Prebendary Scarth described the Roman camp, villa, and temple at Lydney. The party subsequently proceeded to the Speech House, where Mr. J. Bellows, of Gloucester, read an interesting paper on "Ancient British Life in the Forest."

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

The National Association of Master Builders of Great Britain held their seventh half-yearly meeting at the rooms of the London Master Builders' Association, 27A, King-street, Covent Garden, London, on Tuesday, the 26th ult., when representatives were present from the local associations of the principal towns in the kingdom.

The report and audited accounts for the past half-year were read and adopted. Mr. Clay, the late president, was presented with an illuminated address expressing the thanks of the Association for his past services as president.

The occasion, being important, was embraced by the London builders as a fitting opportunity to entertain their provincial brethren. A numerous gathering dined at the Criterion in the evening. Mr. Stanley G. Bird (the president) occupied the chair, and amongst those present were Mr. R. Neil, jun., Mr. B. Hannen, Mr. Ex-Sheriff Burt, Mr. T. Clay, Mr. G. Plucknett, Mr. W. H. Cowlin, Mr. E. Hughes, Mr. J. Whitcher, Major Waller, Mr. J. Leslie, Mr. C. W. Barker, Mr. J. B. Simpson, Mr. L. J. Maton, Mr. A. Bird, Mr. J. T. McLachlan, Mr. W. C. E. Creswick, Mr. W. Knox, Mr. W. Clulee, Mr. Bennett, Mr. Beanland, Mr. Malone, Mr. J. H. Colls, Mr. J. T. Chappell, Mr. W. A. Colls, Mr. H. G. Smith, Mr. A. J. Mansfield, Mr. A. R. Smith, Mr. R. Gurney Hoare, Mr. J. McLachlan, Mr. J. Bradney, Mr. T. E. Phillips, Mr. W. Bird, Mr. C. Bird, Mr. Bonnar, Mr. C. J. Bennett, Mr. A. Thorn, Mr. T. Patrick, Mr. H. Kelly, Mr. E. Kelly, Mr. S. E. Haward, Mr. J. Clemence, Mr. J. Wall, Mr. Barfield, Mr. T. Hook, Major Bratton, Mr. G. S. Pritchard, Mr. R. D. Lown, Mr. H. Dove, Mr. Callaghan, Mr. Nightingale, Mr. J. C. Hannen, Mr. W. Southern, Mr. Kirk, Mr. Randall, Mr. Doulton, Mr. Marsden, Mr. Edwards, Mr. Chambers, Mr. H. Burman, Mr. Little, Mr. Dove, Mr. Collingridge, Mr. Stedman, Mr. Duffield, Mr. Webster, Mr. Adamson, Mr. F. J. Dove, and Mr. E. S. Henshaw.

The loyal toasts were given from the chair, and duly honoured.

Mr. E. Hughes proposed "The Army, Navy, and Reserve Forces," Major Bratton (secretary of the Builders' Benevolent Institution) and Major Waller responding.

Mr. Plucknett gave the toast of the evening, "Success to the National Association of Master Builders of Great Britain, and the health of the President," which was received with cheers. He said that, considering the short period of the society's existence, the results that had been attained were extremely gratifying. Many of the leading builders of the country had already joined them, and he felt sure that motives of self-interest, if no other motives, would induce all the great building firms to enrol themselves in the list of members. He himself looked forward to the time when, through the operations of this Society, strikes and lock-outs would be things of the past. With the toast he desired to couple the name of their president, Mr. Stanley G. Bird, who had worked zealously for the objects of the Association, and without whose courage and perseverance at the commencement he doubted whether it would ever have come into existence.

Mr. Bird, who was heartily cheered, said he felt himself justified in declaring that the Association of Master Builders had already rendered to the trade services of a most important character. He doubted, however, whether it was possible yet to foretell the happy period when strikes should be an end; on the contrary, he believed that with a return of prosperous times their troubles would commence again. At that time, however, the trade generally would understand the immense advantage of being able to refer their difficulties to such an institution as this. Alluding to specific objects that had already been attained through the instrumentality of the Association, he mentioned a new form of contract, and the establishment (arising out of the Employers' Liability Act) of the Builders' Accident Insurance Company.

Mr. Hannen gave "The Local Associations of Master Builders," insisting upon the advantages rendered by these institutions.

Mr. R. Neil and Mr. W. H. Cowlin replied.

Mr. Clay responded for "The Visitors."

PROPOSED ARCHÆOLOGICAL CONGRESS AT MALVERN.

In 1848 the British Archæological Association held its fifth annual congress at Worcester, and in August, 1875, its thirty-second annual meeting at Evesham, in the same county; notwithstanding these two visits, the ground that it is now proposed to explore in the neighbourhood of Great Malvern contains many objects of archæological interest probably but little known to the members and visitors who will attend this, the thirty-eighth annual meeting of the Association.

Malvern has been described, justly enough, by Horace Walpole and others, as one of the most beautiful and picturesque localities in Great Britain. It embodies in itself and immediate neighbourhood events and episodes connected with many remarkable epochs of our history, and notably with the great civil struggles of the Wars of the Roses and the later deadly conflicts at Edge Hill and the city of Worcester, contests fraught with consequences of the deepest import for the then future glory of our country, the study of which presents features of unusual interest to the archæologist and historian. The council of the British Archæological Association gladly availed themselves of the encouragement offered by the late lamented Mr. Chance and other leading inhabitants, to hold their thirty-eighth annual congress at Malvern, through their hon. congress secretary, Mr. George R. Wright, F.S.A., who, with a view to carrying it to a successful issue, has been making all requisite arrangements, in conjunction with an influential local committee, of which the hon. secretaries are Messrs. W. Tyrrell and Edward Nevinson.

The opening day at Malvern, Monday, August 22nd (after the inaugural address of the President, the Very Rev. the Lord Alwyne Compton, D.D., Dean of Worcester, at 3 p.m.), will be chiefly dedicated to an examination of the Priory church, founded *circa* 1080. This portion of the once much larger edifice, and which has been used as the parish church of Malvern since the days of Queen Elizabeth, presents, in its mixed styles of Early Norman and Late Perpendicular work, many features of interest and beauty, and as far as its famous painted-glass windows are concerned, is considered to be unrivalled by any other ecclesiastical edifice in the world. In the evening there will be a public dinner at the Imperial Hotel, to which ladies are specially invited.

In addition to the week's work at Malvern, it is intended to visit Worcester on the following Monday and Tuesday, August 29th and 30th, and thus again pay a tribute of respect to the new beautifully restored cathedral, and to the many other objects of antiquarian interest to be found within the time-honoured walls and neighbourhood of the city of Worcester.

The Mayor and Corporation of Worcester have, with characteristic kindness, already offered every facility to the Association for the purposed visit to their city; and the Worcester Diocesan Architectural and Archæological Society have also signified their wish to co-operate with the Association, both at the Malvern meeting and at their own ancient city.

On Wednesday, August 31st, it is proposed to go to Cheltenham for the purpose of examining some of the MSS., rare books, and pictures, at Thirlestane House, which were collected by the late Sir Thomas Phillipps, bart. These, by the kindness of the Rev. J. E. Fenwick, M.A., will be placed before the members and visitors, and explained to them by Mr. E. Maunde Thompson, V.P., F.S.A., keeper of the MSS. British Museum. Afterwards visits will be made to Leckhampton Church, Prestbury, and Bishop's Cleeve.

During the Congress week at Malvern, excursions will be made by carriages and railway to Birtsmorton Court, a moated manor-house of the fourteenth century: the adjoining church; "Payne's" Place, where Margaret of Anjou took shelter; Tewkesbury battle-field; the restored Abbey Church and old houses at Tewkesbury; Severn-end Manor House, Brockeridge-common, Ripple Church Twining, Bredon Church and Tithe Barn and Bredon Hill (king and queen stones and camp), Bosbury and Ledbury Churches, Wall's Hill Camp, Much Marcle and Kempley Church, the latter having some good frescoes on its walls, discovered a few years since; Kidderminster Church, Warshill (close to Habbersley), Bewdley, Ribbesford, Areley Kings for Manor House, &c.; Redstone Hermitage and Astley Church, thence to Moor Hall, by the invitation of Mr. John Brinton, M.P., who will take charge of and conduct the party on the Kidderminster day; Little Malvern, Herefordshire Beacon, and Midsummer Camp, an ancient British fortress of large extent; Branshill Castle, a Norman stronghold; and Eastnor Castle and Park, by the kind permission of the Earl Somers, &c.

Meetings will be held every evening in the schoolroom of the college, by the courtesy of the authorities, at half-past eight, for the reading and discussion of Papers, after the opening day, and all members or visitors desirous of contributing papers on local or other archæological subjects are requested to communicate at once with the hon. secretaries, Mr. E. P. Loftus Brock, F.S.A., 19, Montague-place, Russell-square; or Mr. W. de Gray Birch, F.S.A., British Museum, Bloomsbury.

THE PROPOSED NEW WORKHOUSE AT CHAMPION HILL, DULWICH.

There appears a probability that the proposal of the St. Saviour's Guardians to erect a large new workhouse at Champion Hill will not be carried out, although the land has been purchased for the purpose. It is a matter of notoriety that the proposal has met with the strongest opposition on the part of the owners and occupiers of property in the locality, and now the several parishes interested are taking steps to prevent the erection of the building, which, it is stated, would cost something like 200,000*l*. The parishes comprising the Union of St. Saviour's,—Newington, St. George's, Christchurch, and St. Saviour's,—are about to be called together by delegates to take into consideration the great outlay contemplated by the erection of the proposed building.

COMPETITIONS.

New West St. Giles's Church, Edinburgh.—The competing plans for this new church were submitted to Mr. John Macvicar Anderson, hon. secretary of the Royal Institute of British Architects, for his opinion. That gentleman has now reported in favour of the design by Messrs. Hardy & Wight, 7, St. Andrew's-square. The style of the building which Mr. Anderson recommends for adoption is Gothic of the Decorated period, with tower and spire, 160 ft. high. The spire is slender in its proportions, and rises from a parapet of open quatrefoil-work, similar to the work in old St. Giles's tower, with flying buttresses at the angle pinnacles. The church shows a nave, aisles, and transepts, the arcade supported on polished pillars of red granite. Accommodation is provided for 1,000 persons, the cost not to exceed 7,000*l*.

Gateshead Workhouse.—At a meeting of the Gateshead Board of Guardians, held on Tuesday, the 19th ult., the designs submitted in open competition by Mr. W. Lister Newcombe, F.R.I.B.A., of Newcastle-upon-Tyne, for proposed additions to the Workhouse, Union-lane, were selected as the best, and received the first premium.

Lincoln's-Inn Chapel.—We are informed that in extending Lincoln's-inn Chapel westward, with a new staircase and vestries, in general accordance with the late Sir Gilbert Scott's design, made in contemplation of the removal of the old and almost ruinous chambers which enclose the end of the chapel, and contains its staircase, Mr. Salter, who designed the last alterations at King's College, London, and at St. George's Hospital, is employed as architect. Messrs. Longmire & Burge's tender has been accepted to complete the work in fifteen months.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,091. T. R. Harding and T. W. Harding, Leeds. Fluid meters. July 15, 1881.

3,107. H. J. Haddan, Kensington. Heating apparatus. (Com. by J. F. Lebreton, Besançon, France.) July 16, 1881.

3,114. W. R. Lake, Southampton-buildings. Construction of roofs. (Com. by J. Schieder & C. Polzer, Vienna.) July 16, 1881.

3,115. F. Worth, Frankfort-on-the-Main. Apparatus for flushing water-closets, &c. (Com. by G. Mack, Frankfort.) July 16, 1881.

3,156. T. E. Parker, Battersea. Open fire-grates, &c. July 20, 1881.

3,170. R. R. Gibbs, Liverpool. Cooling, &c., air. July 21, 1881.

3,183. W. Cunnington & W. Cunnington, jun., Chelsea. Decoration of paper-hangings. July 21, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

July 19, 1881.

529. B. C. D. Greenhill, Puriton. Machinery for pressing with perforations bricks, tiles, &c. Feb. 8, 1881.

1,155. S. J. Payne, Charlton. Manufacture of firebricks, &c. March 16, 1881.

July 22, 1881.

1,457. R. H. Reeves, Parkhurst. Ventilating apparatus. April 2, 1881.

1,618. G. E. Wilson, Leeds. Latches and locks. April 13, 1881.

2,857. K. W. A. Leverkus, Manchester. Ventilators, &c. June 30, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending July 23, 1881.

4,768. J. Couper, jun., Glasgow. Decoration or ornamentation of glass for panels of grates, &c.

The design is produced on the inner surface of the glass. (*Pro. Pro.*) Nov. 9, 1880. Price 2d.

4,938. W. Wyman, Gloucester. Gas-stove for heating and ventilating.

Four concentric metallic shells are arranged within each other, closed at the top and bottom, so as to form two annular chambers, which communicate with each other. These chambers are heated by gas-jets beneath and the heated air is allowed to flow from the chambers into the room to be warmed. Nov. 27, 1880. Price 6d.

5,120. C. E. Gibson, Birmingham. Holding and regulating window-blind cords.

A cradle-plate is fixed to the frame, to which is attached a carrier, having two grooved rollers, which are pressed against the plate by springs. The cords are passed round these rollers, which are held in position by the springs, regulated by a screw and nut. Dec. 8, 1880. Price 6d.

5,164. E. Brooke, Huddersfield, drain-pipes, &c.

Ribs or bars are formed outside the pipes, so as to keep them true when in position, and the joints are made by segments of circles of the same size as the pipes, being formed of cement and introduced into the socket. Dec. 1st, 1880. Price 4d.

5,195. H. S. Snell, Southampton-buildings. Smoke-consuming grates or stoves.

This relates to that class of grate which revolves on a pivot at the back thereof. The cylindrical sides are solid metal instead of bars, and the pivot is fitted with a number of friction rollers. A spring handle is used to revolve the grate and the covers have each a locking-bar attached. Dec. 11, 1880. Price 6d.

5,212. B. Banks, Leeds. Ash-pans for fire-places.

The ash-pan is divided into two chambers by a horizontal grate which arrests the cinders, but allows the ashes to fall through to the bottom. Dec. 13, 1880. Price 6d.

5,215. W. Edes, Dover. Sewers and drains.

The upper part of the sewer or drain is perforated with small holes to allow of the escape of the gases. Dec. 13, 1880. Price 6d.

5,220. J. R. Pickard, Leeds. Fire-grates.

Chambers are formed near the grate into which the gases pass and mix with the air, whereby the carbon is entirely consumed. Dec. 13, 1880. Price 6d.

5,230. W. P. Thompson, Holborn. Hiding or filling up corners or skirtings of rooms or stair-cases.

A plate is cut or stamped out so as to fill the corners and prevent dust accumulating. (Com. by D. McFee, R. A. Kelland, and D. E. McFee, Canada.) (*Pro. Pro.*) Dec. 14, 1880. Price 2d.

5,266. W. Verity & B. Verity, Euston-road. Apparatus for withdrawing or forcing air for ventilating, &c.

A cylinder surrounds the central inlet opening of the revolving fan, within which are screw blades attached to the axis of the fan, which in their revolution draw in a supply of air to the fan casing. The ends of the axis are mounted in oil vessels to diminish the friction. Dec. 15, 1880. Price 6d.

5,284. O. Seydell, Birmingham. Supplying pure air to cities, towns, &c.

The pure air is collected from the sea-shore or rural districts, and pumped into pipes which are led to the town to be supplied, where there are branches off the main pipe to each house, &c. Dec. 16, 1880. Price 4d.

5,290. B. J. B. Mills, Southampton-buildings. Paving roads, &c., with wood.

The blocks are formed with a groove across their base, and are coated with plastic waterproof coating, made of gas pitch, coal tar, mineral oil, sulphur, and resin. They are mounted on a foundation of artificial fusible lava, consisting of pulverised stone, pitch, asphalte, mineral tar, resin, scoria, and lime, which are heated up to 150° centigrade and made into blocks. These being placed in position are sealed to each other by mortar or lava. (Com. by A. Treasaussy, Paris.) Dec. 17, 1880. Price 8d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

ELY CATHEDRAL GRAMMAR SCHOOL.

OPENING OF NEW BUILDINGS.

An important educational movement has been going on for some years in the diocese of Ely, with the object of re-founding the Cathedral Grammar School as a Public School on a sufficient scale to meet the educational requirements of the diocese. On the 27th ult. some extensive new school buildings, which have been erected under a scheme issued by the Charity Commissioners, were formally opened by the Bishop of Ely in the presence of a very large and influential company. An interesting address was delivered by Dean Merivale on the occasion, tracing the history of our cathedral schools from the time of the Middle Ages, and showing the important part which they were designed to play as centres of religious education. By the reconstruction and expansion of the cathedral school at Ely provision is now made for 100 boarders, the new buildings being replete with all modern appliances. The cost of board and education is fixed at 51*l.* a year, and it is proposed to reduce this sum in favour of the poorer clergy and professional men by donations of scholarships of 25*l.* a year, the Bishop offering to maintain one for clergymen's sons.

The plans were prepared by Messrs. Carpenter and Ingelow, and the works have been carried out by Mr. S. Foster, of Kempston.

The new building, or Hereward Hall, as it is to be called, is built in the fourteenth-century style, of red Suffolk brick with Bath stone dressings, and forms, together with the new Theological College, an important addition to the architectural features of the city. It is situated opposite to the Ely Porta, built by Walpole in the fourteenth century, which is used as the large school-room, and stands on the site of the old Pilgrims' Hostelry. It comprises large, handsome, and well-arranged dormitories for 60 additional boys, with a good-sized library, preparation rooms, private studies, masters' and matrons' rooms, sick quarters, and, in fact, all the accommodation with the best modern arrangements, which are now considered suitable for our large public schools.

Some alterations are also being made in the old block of buildings, formerly the monastic dormitory. It is a building of early Norman date, raised and altered by Alan de Walsingham. He divided the stories by stone vaulting in small square bays, with columns down the centre. This crypt is used as the dining-room, and is now being lengthened by the removal of modern walls, so as to accommodate in addition the sixty boys of the new hostel.

The great dormitory above is being restored and divided into cubicles, and other improvements are being made as an instalment of more extensive works to be carried out in the future.

THE CHAPEL OF ST. ANNE'S SCHOOL, ABBOT'S BROMLEY.

St. Anne's School is erected for the education of girls of the middle and lower-middle classes. It is in connexion with the College at Lancing, and under the charge of the Provost of the Midland County Schools, with a lady resident, and mistresses under. The school, when completed, will accommodate 100 girls. Certain old buildings which were acquired have been enlarged, and a new wing built. A portion of the chapel, including the reredos, was first erected as a memorial, and it, with its ante-chapel, is now completed. It is of narrow but very lofty proportions, and is lighted by a series of two-light windows. The ante-chapel has an organ-gallery. Each story opens into the chapel by an arcade of three arches, and there is a large rose-window over the roof of the ante-chapel. On the north side is the bell-turret, finished with open arcaded work, and a shingled spire. The material is local brick, purposely made to a thickness of 2 in. The dressings are of Bath stone. The floor-tiles are the gift of Mr. Minton Campbell. The contractor is Mr. Yates, of Shifnal, the architects being Mr. R. Herbert Carpenter and Mr. B. Ingelow, and the clerk of works Mr. Tompson. The reredos, with sculptured figures of alabaster and Mansfield stone, has been executed by Mr. Hill, of Chelsea, from the architects' designs.

COOKING BY GAS.

The Welshpool Gas Company have recently held an exhibition which is certainly a new departure from the accepted traditions, and which deserves to be repeated by every gas company in existence. Taking stalls in the Welshpool market, they fitted these up as a small temporary *restaurant*, with the domestic cooking apparatus made by Mr. Fletcher, of Warrington, not, however, confining themselves to one maker exclusively, but exhibiting a fair selection. They offered at the conclusion to put up any of the apparatus free of charge for any person to whom they supplied gas. That the idea was a success may be proved by the fact that all the apparatus in use was sold at the conclusion. Their profit on the apparatus should be ample to more than pay all expenses, and they have secured a number of permanent customers for their gas, who, it is probable, would never have adopted gas cooking if they had not been invited to "taste and try before they buy." An exhibition of this kind is simple, useful, and pays everybody concerned, both sellers and buyers, and wherever it is repeated is sure to attract numbers of interested observers. It might probably pay any dealer in gas-cooking apparatus to repeat the experiment in his own town; but it is certain to pay any gas company, as they not only get the dealer's profit on the apparatus, but also—what is far more important—a number of permanent customers for their gas, who are of a peculiarly valuable class, as their gas consumption would be in the day time and most in the summer, at the times when all gas-works are partially lying idle, eating their heads off with establishment expenses and interest of capital on unemployed plant.

To people who have a chronic habit of grumbling at their gas bills, the following may be of assistance in both clearing up the cause and reducing the bills at the same time. Some months ago a family whose gas bill for lighting only amounted to over 5*d.* per day (130 cubic feet), asked Mr. Fletcher, of Warrington, to supply them with a complete gas cooking apparatus. On being asked what the probable cost of gas for cooking would be for a family of seven, he gave it as about 1½*d.* per day as a maximum. This statement was looked upon as an absurdity, and to catch him napping the meter was closely watched day by day at different hours. The consequence was that the meter dial was seen to be constantly on the move, even when no gas was used. An examination was made, and a considerable leakage was discovered and made good. When this was made right, the gas consumption, as indicated by the meter, at once dropped to 72 cubic feet per day,—less than 3*d.* for both lighting and cooking. As this reduction was brought about indirectly by the introduction of gas cooking, it may practically be said that the cooking costs 2*d.* less than nothing per day. Immediately behind the dial of a gas-meter, in the same little box, will be seen a small horizontal drum, with the figures 1 and 2 on it. This drum revolves once for every 2 cubic feet passing, and those who doubt their gas bills can easily see for themselves whether any gas is passing when all the taps are turned off. If when no gas is being used this drum revolves once in half an hour, the waste of gas at 3*s.* 6*d.* per 1,000 cubic feet will be equal to 4*d.* per day, or about 6*l.* per annum. If the drum revolved once in two hours with all taps closed the leakage would be quite sufficient to pay the expense of a thorough search for it, and show a handsome profit. Most people have an idea that if there is any leakage of gas they would be sure to smell it. This is a mistake; leakages of the worst kind occur frequently under floors which have often a free current of air passing, these leakages being often caused by nailing carpets, &c., down, and from the free ventilation underneath the leakage is not at all likely to be discovered except by the movement of the meter. As the watching of the meter is a simple matter, costing nothing, the suggestion is one which is well worthy of attention.

INTERNATIONAL ARCHITECTURAL COMPETITION AT ST. PETERSBURG.

A COMMUNICATION has been received from the Foreign Office, in a letter from Lord Tenterden addressed to the President and Council of the Royal Institute of British Architects, to the effect that British architects are invited to join in a competition for a church to be erected at St. Petersburg, on the spot where his late majesty the Czar was assassinated. The Institute of Architects publish in No. 19 of their "Proceedings" a translation of the official particulars given in the *Journal de St. Pétersbourg*, and this translation has been reprinted in the daily papers, so that it is scarcely necessary for us to repeat the particulars here. Applicants at the rooms of the Institute, 9, Conduit-street (where a plan of the site may be seen) will doubtless be able to obtain complete copies of the conditions.

COMPETITIVE DESIGNS FOR CHRISTMAS CARDS.

THE following is a list of the competitors to whom the judges have awarded prizes:—

First Prize, 150*l.*—Linnie Watt.
Two Prizes, 100*l. each.*—Caroline Paterson and Harriet M. Bennett.
Two Prizes, 75*l. each.*—E. A. Lemann and Harry Arnold.
Five Prizes, 50*l. each.*—Miss S. A. Ashworth, Alice C. Swan, Linnie Watt, Edgar Giberne, and A. M. Chambers.
Ten Prizes, 25*l. each.*—H. Sterling, Catherine A. Sparkes, Henry Anelay, Ellis Wilkinson, Archibald Thorburn, Mrs. J. W. Whymper, E. B. S. Montefiore, Frank E. Cox, Mrs. J. W. Whymper, and Bringhurst B. Lawrance.

To fifty of the other competitors the Messrs. Hildesheimer & Co., who instituted the competition, have awarded prizes of 20*l.* each. The ladies have again taken off the largest proportion of the amount offered,—1,100*l.* against 900*l.* to men.

NEW PAROCHIAL SCHOOL BUILDINGS AT LEYTONSTONE.

THE St. Matthew's Bethnal-green Board of Guardians are erecting new parochial schools in connexion with the parish of Leytonstone, and last week the memorial-stone of the first portion of the schools was laid by Mr. Collins, chairman of the Board. The accommodation to be provided in the first instance consists of a school-house for 500 children, and of six semi-detached houses, constructed on the group or cottage-home principle, each to accommodate 48 boys. The cottages for the girls and infants will be built afterwards. The architects of the schools are Messrs. A. & C. Harston, and the builders are Messrs. Jackson & Todd, of Hackney, the amount of whose contract is 11,570*l.* Mr. Geo. Poole is clerk of the works.

SALES OF BUILDING LAND AT THE AUCTION MART.

THERE were several important sales of suburban mansions and building estates at the Auction Mart last week. Messrs. Baker & Sons submitted to competition a freehold property at Willesden, called the Roundwood Park Estate, comprising two private residences, and 92 acres of land, which the auctioneer stated was most eligibly situated for building upon, being in one of the best parts of Willesden, and within a convenient distance of more than one railway station. After a close competition it was sold for 33,590*l.* Subsequently Messrs. Baker offered for sale Priory House, Southgate, with two acres of freehold land attached, which were sold for 3,160*l.*

Messrs. Brown, Roberts, & Co., likewise submitted for sale several freehold properties in Penge and Sydenham, the most important of which was 31 acres of building land in Penge, which after an animated competition was sold for 44,355*l.*, being at the rate of upwards of 1,400*l.* an acre. The same auctioneers likewise sold freehold ground-rents in Sydenham, amounting to 237*l.* per annum, for 7,115*l.*

Messrs. Glaisher & Sons also offered for sale the St. Helena-gardens Tavern, at Rotherhithe, containing four acres of freehold land. The property, which was described as of great value as a site for the erection of either business premises or private houses, was sold for 11,750*l.*

COST OF MODERN BUILDINGS.

IT is interesting to compare the cost of some of the most recent buildings of the present day. The new Grand Opera at Paris cost 40,000,000 francs; the new Hôtel de Ville, 40,000,000 francs; the new Paris Post Office, 30,000,000 francs; extension of the Conservatoire of Music, 8,000,000 francs; the new Museum of Victoria, Australia, 100,000*l.*; the Maison du Roi, in the Brussels Market-place, 2,000,000 francs; the new Provincial Government Buildings at Bruges, 2,000,000 francs; the Brussels Cavalry Barracks, 4,000,000 francs; the new Brussels Mint, 4,000,000 francs; the Palais des Beaux-Arts at Brussels, 3,000,000 francs; the new Museum at Antwerp, 2,000,000 francs; the Palais de Justice at Brussels, 40,000,000 francs; and the Department of Justice Building at the Hague, 1,700,000 francs. We may compare with the above the cost of the following buildings in the United Kingdom:—The Houses of Parliament at Westminster cost 3,500,000*l.*, or 87,500,000 francs; the new Foreign Office, Whitehall, 550,000*l.*; the Record Office, 120,000*l.*; and the Law Courts are estimated, exclusive of special fittings, at nearly 900,000*l.*

FIRE IN THEATRES.

A COMMISSION was recently appointed by the city of Vienna to report on the state of the theatres, with special reference to the possible occurrence of a similar disaster to that of Nice. In commenting on the recommendations of the commission, one of the leading authorities on the subject, Herr Orth, has called attention to the necessity of limiting the use of wood to parts of the building where it is absolutely necessary, and of employing iron and stone where it is possible to do so. He further suggests that such woodwork as is indispensable should be made as safe as possible by one of the known anti-inflammable processes. The suggestion is also made to have fireproof rooms near the stage for the temporary security of the staff of the theatre in case of fire.

ARCHITECTS' ACTIONS.

LINDLEY *v.* KNIGHT.

WM. JOHN LINDLEY, surveyor and architect, of Colne, sued Calvin Knight, manufacturer, of Colne, for 10*l.* 16*s.* 8*d.*, balance of an account of 15*l.* 16*s.* 8*d.* cost of plans.

Mr. J. Sutcliffe, Burnley, appeared for the plaintiff, and Mr. T. Nowell, Burnley, for the defendant.

The plaintiff was called, and he stated that on the 12th of November, 188-, he received instructions from the defendant as to plans for a house to be erected near houses which his brother, Mr. A. Knight, the defendant, was building. The defendant called upon witness on the 16th of November, and altered the plan. Other interviews between the defendant and plaintiff took place, and the plans were several times again altered, and ultimately the various works were advertised as to be let, but the building was not gone on with. The defendant had paid 5*l.* on account.

Cross-examined, the plaintiff said that the plans had not been touched since the 16th of December. The plans were advertised to be seen on the 13th of December, and the tenders (were to be received by the 22nd. The plans were stopped on the 17th of December. Since then Mr. Knight had erected a house somewhat similar to that projected one for which witness prepared plans.

Thomas Watson, architect, of Burnley, said that he had seen the plans prepared by the plaintiff. As the house was now, he valued it at about 1,400*l.* at least, and he thought 1½ per cent. would be a very fair charge; this would amount to 17*l.* 10*s.*

William S. Varley, architect, of Blackburn, also spoke in support of the charge made by the plaintiff.

For the defence, Mr. Nowell complained that the plaintiff failed to have the plans ready according to arrangement, and even when the works were advertised he kept the contractors waiting, and upon this account Mr. Knight had been compelled to engage another architect.

The defendant, Calvin Knight, was called, and he said that he gave the plaintiff particulars of the house he wanted building, just as the plaintiff had already said. He laid particular stress upon the condition of regularity, for if this was not complied with he told the plaintiff they would get across. Three or four times after the 13th of December witness called upon the plaintiff, once about the 22nd, the day upon which the tenders should have been received. The plans, however, were not ready. He stopped the work on the Friday after the day fixed for receiving the tenders.

Smith Whitehead, surveyor, after examining the sketches produced in court, thought they were the work of two or three days.

His Honour, in giving a verdict for the plaintiff, said he had in his opinion gone about his work in a very business-like and professional way. The fact that the plaintiff had also on hand work for defendant's brother, who was equally urgent with himself, he took to be a reasonable excuse for the delay which had occurred in the preparation of the defendant's plans. The plaintiff had from beginning to end given his evidence in a very straightforward manner, and his diary and call-book confirmed his consistency. As for the evidence given by Mr. Knight as to seeing the plaintiff on the Friday after the 22nd of December, he thought Mr. Knight must be labouring under a delusion, for the day must have been, as the plaintiff had said, and as his diary also said, the 17th. Mr. Knight had clearly been mistaken in the day.

LANDLORD AND TENANT.

AN important case as bearing on the rights of landlord and tenant, was heard last week at the Clerkenwell County Court, before Mr. Gordon Whitbread, the judge. The plaintiff was Mr. Doyle, a tenant of Mr. Wood, the defendant, and the action was brought to recover 9*l.* 10*s.*, being damage sustained by the plaintiff occasioned by the defendant's neglect, as landlord of the house, to repair certain defects in the roof. It having been proved in evidence on the part of the plaintiff that the defect in the roof of the house had caused injuries to the plaintiff's furniture, and that the landlord, although requested to do so, had failed to make the necessary repairs, it was submitted for the defendant that at the time the plaintiff took the house there was no specific contract entered into by the landlord to keep the roof in repair, and that, therefore, he was not liable for the damage which the plaintiff had sustained by the defects in the roof. It was admitted by the plaintiff that there was no such specific contract, but it was contended on his behalf that it was, nevertheless, the duty of the landlord to keep the fabric of his property in repair, and that he was responsible for the damage which had been caused by failing to repair after notice to do so.

Mr. Whitbread, in giving judgment, said that according to the law, as laid down in "Woodfall's Landlord and Tenant," the landlord, in the absence of any express covenant, was not liable to do any repairs whatever to the house. The plaintiff must, therefore, be nonsuited, with the costs of the defendant.

FIRE!

SIR,—I beg to submit a plan of mine to prevent or retard conflagrations. Flooring-planks can be made non-inflammable by pasting the boards before nailing them down; or two thin boards, paste to paste, to permanently enclose the paste. In the event of a fire, planks, laths, &c., so prepared, will not aid in destruction, and prevent extending.

I use no acids, which destroy wood; no impediment to carpenters' and painters' work; no smell or discoloration, nor extra expense. For stairs, ship-fittings, and timber in mines, it may be invaluable. I propose to supply the planks ready, or the paste, for the workmen to brush it on themselves. B. T.

FIRE PREVENTION IN THEATRES.

SIR,—I am aware that there are several public buildings, notably theatres, which are amply provided with fire-extinguishing appliances, but is there one of the particular class to which my heading points fitted with proper indicators? I would suggest that such buildings having tanks only should be fitted with an electric bell alarm (the same to be in the manager's room), and when the water gets at "half-full," which should be plainly written on the indicator, the bell should sound, or in the event of the fire-hydrants being connected to the street mains a similar contrivance should exist. Water in such buildings is frequently drawn off from the tanks for "water scenes" and other purposes; hence the imperativeness of the arrangement suggested herein. Besides this, managers frequently are changed. J. C. MERRYWEATHER.

The Guardians of the Parish of Chelsea, with the assistance of the powers of the Land Clauses Act, conferred on them by the Metropolitan Poor Act, 1867, with which the former Act is incorporated, have, after publishing the statutory advertisements and giving the necessary notices, arranged for the purchase by agreement of the block of property adjoining and bounded on the west side by Chelsea Workhouse, on the east side by Robert-street, and on the north and south sides by Britten-street and King's-road respectively. The property includes thirty-six houses, a cab-yard and stables, and the infirmary-stables of the London General Omnibus Company. The freeholders were the trustees of the Duchess of Somerset's Westminster Charity. The property is taken for the enlargement of the Workhouse. Messrs. A. & C. Harston, of Leadenhall-street, conducted the negotiations on behalf of the Guardians; Messrs. Debenham, Tewson, Farmer, & Co., Mr. G. A. Wilkinson, and Messrs. Fuller, being the surveyors between whom the claims of the vendors were distributed. Plans for the Workhouse extension are now being prepared by the architects, Messrs. A. & C. Harston.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

SIR,—It may be of interest to those of your readers who intend to send in competitive designs for the new municipal buildings for this city to know that the committee on new municipal buildings,—acting under full powers from the Town Council,—on the 11th ult. appointed Mr. Charles Barry, architect in London, and Mr. John Carrick, City Architect, Glasgow, (1) to select from the designs in the preliminary competition those the authors of which shall be invited to compete in the second and final competition; (2) to advise the Magistrates and Council in the selection of the four best designs submitted in the final competition; and (3) to advise on the probable sufficiency of the estimates submitted by competitors, all in terms of the fourth paragraph of the conditions of preliminary competition.

J. D. MARWICK.

THE ENGLISH LAND SYSTEM.

SIR,—All the highest authorities agree in that the system of land tenure in which the farmer is proprietor of the soil he tills is the most perfect and successful, and this has been proved by the comparisons instituted between the present condition of agriculture in several countries with the peasant-proprietor system of land tenure, and the position of agriculture in those countries under the feudal system. The instances quoted by your correspondent in his interesting letter of the 16th ult. [p. 93, *ante*] are worthless as evidence against the peasant-proprietor system. Probably the yeomen mentioned entered on a farming speculation with inadequate capital and following, and insufficient mechanical appliances; or perhaps the soil was intrinsically bad and unfit for cultivation, except with an excessive outlay. There are other circumstances which may have occurred which would produce failure. Of course, any system of land tenure, *per se*, will not remedy the deficiencies enumerated, such as, for instance, to render a barren soil prolific; although in the case of that great and worthy example of farming, Mr. Mechi's Tiptree farm, we see what science can do in the way of improving a comparatively poor soil.

My suggestions for the recuperation of England's agricultural resources are as follow:—

1. Such an alteration of the land laws as would make it possible for any farmer to become possessed of the land he cultivates in a certain number of years, and make it as easy and inexpensive to transfer land as any other description of property.

2. The appointment of a Minister of Agriculture, who should be required to issue statistics and other information of interest to the agriculturist.

3. The establishment of Chairs of Agricultural Science at our universities and colleges.

4. The diffusion of the knowledge of agricultural chemistry amongst farmers.

5. An agricultural Ordnance map of England, based on the principle of the 1-in. geological Ordnance map, showing the relative excellences of various geographical positions for the production of various descriptions of agricultural produce, &c.

6. A further development of the present excellent system of diffusing barometrical predictions, so that every farmer may be able to safely predict the state of the weather,—a knowledge of incalculable value in harvest time.

7. A general re-arrangement of railway tariffs for the carriage of agricultural produce. Tariffs at present are both irregular and exorbitant, and place English farmers at a great disadvantage in competing with foreigners.

8. The utmost possible adoption of mechanical labour-saving appliances.

If these foregoing suggestions were carried out, and I think they are within the domain of practicability, the immediate future position of English agriculture would become permanently safe and prosperous; and English yeomen would have little need to fear that the price of produce from Manitoba and the Far West would preclude them from farming with a fair average profit.

It is important and necessary that the English agricultural societies should have some programme of reform. The suggestions embodied in this letter may prove useful in the course of formulating such a programme.

B. H. THWAITE, A.M.I.C.E.

DISSENTING CHURCH-BUILDING NEWS.

Chesterfield.—A new Primitive Methodist church is to be erected here. The design is Early Gothic. The architect is Mr. Councillor Jno. Wills, of Derby; the contractor is Mr. Joseph Munks, of Hucknall. The cost will be about 2,200*l.*

Long Eaton.—A new Wesleyan chapel is to be built at Long Eaton. Mr. Jno. Wills, of Derby, is the architect. The design is in the Italian style, and the work is to cost nearly 2,000*l.*

VARIORUM.

THE May number (1881) of the "Transactions of the American Society of Engineers" (vol. x.) is wholly devoted to the consideration of Wind Pressure upon bridges. It includes a paper on the subject by Mr. C. Shaler Smith, member, and a full report of the discussion which followed.——"The Mechanical Engineer's Office-Book: Boiler Construction," by Nelson Foley (Crosby Lockwood & Co), is designed to facilitate work in offices and to give an accurate method of arriving at results without repeating the same calculations over and over again. It is full of diagrams.——The current number of The *Nineteenth Century* includes a paper on "The Arab Monuments of Egypt," in which the writer, Mr. Frank Dillon, seeks to awaken an interest in their preservation. "The mosques of Cairo," he rightly says, "and the examples of domestic architecture which yet remain, are evidences of the high position attained to by their designers, and justify the dismay with which their neglected condition fills the mind of all who are capable of appreciating their beauty. It is a sad commentary upon the boasted civilisation of a century now drawing to a close that no hand has yet been lifted to avert the doom of some of the choicest monuments existing in the world." We cordially agree with him in hoping that this question may be taken up by competent hands, and not allowed to languish for want of active support from those able as well as willing to further so desirable an end. Cairo of late years has been desecrated and disfigured, and ruin is impending over many of the Arab monuments that still remain.——The *Antiquary* (Elliot Stock), has reached its third volume, and this is now before us. It is well printed, on the fashionable paper of the day, with uncut edges, and is full of matter interesting to those who are devoted to the study of the past, with an occasional touch for those who care most for things present, as when Mr. Parker launches out against the conceit of modern English architects and the "bumptiousness" of English engineers (pp. 152, 153). It is now edited, we believe, by Mr. H. B. Wheatley, F.S.A., and is carried on with much spirit.—— The *St. James's Magazine* appears to have entered upon a fresh lease of life. The August number contains pleasant reading.——In the August number of the *Art-Journal* Mr. G. T. Robinson continues his interesting series of papers on "Our Household Furniture: its past History and its present Development." In this he treats of seats, including amongst his illustrations sketches of three in Mr. Godwin's collection of chairs, viz., Anne Boleyn's, Shakspeare's, and Theodore Hook's. Amongst other illustrations in the number is a coloured plate of Satsuma Faïence.——"Birchington-on-Sea and its Bungalows," by Athol Mayhew, with "An Historical Sketch of Thanet," by S. W. Kershaw, M.A., although a very little book, contains a large amount of information on the locality of which it treats. It contains a full account, with illustrations, of the Birchington Bungalows, as built under the direction of Mr. John Taylor, and which were long ago described in the *Builder*. Mr. Kershaw adds some pleasant reading on the Island of Thanet generally. Birchington's important and close neighbour, Westgate, is made conspicuous by the all but entire absence of any mention of it in the neat little book, which looks a little like jealousy.——Part III. of "English Etchings" (185, Fleet-street), includes a subject called "On Strike," by Percy Thomas. It is cleverly executed and an interesting picture, but would scarcely tell its story without the placard on the wall.

The Christchurch Rural Sanitary Authority have requested Mr. J. H. Moore, C.E., Bournemouth, to submit to them a scheme and report on the best mode of draining Westbourne, a new populous district near Bournemouth.

Miscellanea.

Technological Handbooks.—Messrs. Geo. Bell & Sons are preparing for publication a series of Technological Handbooks for the use of candidates in the technological examinations which, instituted by the Society of Arts in 1873, were in 1879 transferred to the City Technical Institute. The rapid increase in the number of candidates since the examination scheme was remodelled, and since the examinations have been supported by the friends of the associated Guilds, is considered to justify the expectation that these handbooks will be successful, since it shows that there are many artisans and others who are seeking to make themselves familiar with the theory of their special industries. It is intended by the publishers eventually to include in the series all the industries specified in the programme of the City Institute; but at first those branches of manufacture have been selected for treatment in which it appears that text-books are most required. In accordance with this idea, six books are now announced for publication:—"Calico Bleaching, Dyeing, and Printing," by William Crookes, F.R.S., V.P.C.S.; "Iron and Steel Manufacture," by A. K. Huntington, F.C.S., F.I.C., Professor of Metallurgy at King's College, London; "Telegraphs and Telephones," by W. H. Preece, F.R.S., Memb. Inst. C.E., Electrician to the General Post Office; "Cotton Manufacture." Part I., Spinning; Part II., Weaving; by R. Marsden, Editor of the *Textile Manufacturer*; "Glass Manufacture." Crown, Sheet, and Plate Glass. By Henry Chance, M.A. (Chance Bros., Birmingham); Flint Glass, by H. Powell, B.A. (Whitefriars Glass Works); Optical and Lighthouse Glass, by John Hopkinson, M.A., LL.D., F.R.S. The series is issued under the general editorship of Mr. H. Trueman Wood, the Secretary of the Society of Arts.

The City Companies.—At the invitation of the Courts of Assistants of the Carpenters' and Drapers' Companies, a large party of artisans connected with the building trades on Saturday visited the halls of these Companies to inspect their architectural and structural features. At Carpenters' Hall, which has just been rebuilt, they were conducted over the building by Messrs. Alfred and Stanton Preston, the warden and Clerk, and shown the Court-room, which contains panelling removed from the old hall, which was built in 1629, and escaped the great fire. This room also contains a noble chimney-piece, carved by Grinling Gibbons, and in an adjoining apartment are preserved some ancient wall-paintings, which were discovered a few years since, and have been carefully restored. In the banqueting-hall a ceiling, reproduced from one designed by Inigo Jones, was pointed out. The party then repaired to Drapers' Hall, where they were met by Mr. Barrow (one of the Court of Assistants), the surveyor (Mr. Reilly), and the clerk (Mr. Sawyer), by whom they were shown over the premises, rebuilt about ten years ago on the site of a mansion belonging to the Earl of Essex, attainted under Henry VIII. The works having been technically explained to the visitors, they separated, first expressing their thanks to the Companies for the kindness and instruction they had received.

Billingsgate.—A scheme for the improvement of Billingsgate Market has been suggested by Mr. W. E. Heath, and has been published by Mr. S. Clark, Paternoster-row. It involves a viaduct from Eastcheap to the market, the upper part of which it is proposed to remove, and to form upon the internal columns a flooring or roadway over the entire area, pierced with staircases and wells for hydraulic lifts, which would take ordinary packages, and others for loaded vans and carts; a bridge or viaduct would be thrown over Lower Thames-street, at the western end of the market. Plans accompany the scheme, and we are bound to add that they do not lead us to suppose that the scheme ought to be carried out.

Ilford.—A new burial-ground, for the Great Ilford Burial Board, was consecrated on the 21st ult., by the Lord Bishop of St. Alban's. The ground is about four acres in extent, and is in the rear of St. Mary's Church, on the Romford-road. It has been enclosed, laid out, and drained, and a chapel built thereon, from the designs and under the superintendence of Mr. C. J. Dawson, architect, Barking. The contractors were Mr. Impey, of Leytonstone, for laying out and draining the ground, and Mr. C. Mills, of Ilford, for enclosing the same, and building a chapel.

Fine Art and Industrial Exhibition at Cardiff.—An exhibition of paintings, sculpture, engravings, drawings, porcelain, machinery, &c., was opened at the Drill-hall, Cardiff, on the 29th ult., by the Mayor (Mr. Rees Jones), who delivered a short address, referring to the object in view in holding the exhibition, which was to provide means for furnishing the new free library building now in course of erection, and expressing a strong hope that the object sought for would be realised. The exhibition as a whole is reported to be an extremely good one. The number of paintings, both ancient and modern, is very large, covering all the walls of the spacious building, and there are many still to be hung. Among the exhibitors of modern paintings are MacCallum, Vicat Cole, Anmonier, Edwin Hayes, Claude Calthorpe, Holyoake, T. K. Pelham, Benjamin Leader, John Mogford, J. Buxton, Knight, Rook, Carl Hache, Otto Weaver, Mrs. Murray, J. G. Philp, A. K. Johnson, E. J. Soper, A. P. Newton, and many others; and among the works of the ancient masters are paintings ascribed to Holbein, Rembrandt, Hobbema, Gerard Douw, Guido Reni, Pannini, and many others. The South Kensington Museum sends a series of water-colour drawings illustrating the progress of art from the early part of the eighteenth century until the present time. The Right Hon. W. E. Gladstone sends a large case of works in Achin ivory; Sir E. J. Reed, M.P., sends a large number of curiosities, in addition to several valuable paintings; the Marquis of Bute contributes several paintings by Hobbema, Holbein, Rembrandt, and others. There is also an extensive display of china, porcelain, wood-carvings, and furniture.

The City Day Census.—At the meeting of the Local Government and Taxation Committee of the Corporation, Mr. W. Lawley, the chairman, and Mr. B. Scott, Chamberlain of London, presented their preliminary report of the City Day Census, taken three weeks after the imperial census of this year. We are informed that the figures may be slightly altered after final examination and check. Total residents, occupiers, and persons employed, 1881:—Males, 195,287; females, 44,095; children, 21,288,—total, 260,670. The imperial census gives for the resident night population alone on Sunday night, April 4, 1881:—Males, 25,085; females, 25,441,—total, 50,526. The mercantile and commercial population in 1881 is 210,144; in 1866 it was 170,133, being an increase of 40,011. The decrease in the night residents and caretakers since the Imperial Census of 1871 is 24,371; the persons resorting to the City on foot and in vehicles has greatly increased; in 1881, in a day of 12 hours (5 a.m. to 5 p.m.), 589,468; in 1866, in a day of 12 hours (6 a.m. to 6 p.m.), 549,613,—an increase of persons, 39,855; in 1881, in a day of 16 hours (5 a.m. to 9 p.m.), 739,640; in 1866, in a day of 16 hours (5 a.m. to 9 p.m.), 679,744,—an increase of persons, 59,896. The rateable value of the City keeps pace with the increase of population. In 1868, when the last day census was taken, it was 2,109,935*l.*; it is now (1881) 3,537,561*l.*,—increase, 1,427,626*l.*

The International Medical and Sanitary Exhibition.—The preparation of a design for the diploma to be awarded by the Parkes Museum in connexion with the Hygienic Exhibition now open at South Kensington, was entrusted to Mr. W. Cave Thomas. The design, we are told, includes a female figure, representing Sanitary Science, standing at the prow of a boat in the act of casting her "life buoy" (hygiene) into the seething ocean of human ills. On Monday next, Mr. Eric Erichsen and the Exhibition Committee will be present at the Exhibition during the afternoon to receive the members of the International Medical Congress. The Exhibition will finally close on the 13th of August.

Part of the Workmen, to the number of seventy-five, of Messrs. Thos. C. Halliday & Sons, builders, of Greetham, Oakham, and Stamford, had an outing at Belmisthorpe on Saturday last, a band of music and good cheer helping in the day's recreation. Good feeling and good wishes were manifested both by employers and employed.

Builders' Machinery at the Melbourne Exhibition.—Messrs. F. W. Reynolds & Co., Southwark, have been awarded gold and silver medals in addition to several honourable mentions for special and patent builders' machinery and appliances.

Improvements near the Houses of Parliament.—In the House of Lords on the 29th ult., Lord Lamington asked whether, before coming to any determination as to the contemplated improvements near St. Margaret's, Westminster, her Majesty's Government would consider how far it was desirable to carry out the recommendations of the Committee on Public Buildings of 1878. In the opinion of that committee, it would be economical to borrow 1,500,000*l.* However, he would leave that part of the report alone, and would only ask whether her Majesty's Government intended to take down the houses at the end of Parliament-street. The approach to the Houses of Parliament was now a disgrace to the country. Moreover, to leave it in its present state would lead to increased expenditure, as the Government would eventually have to pay more for the leases of the houses. The improvement of a great metropolis was a question worthy of the consideration of statesmen. The Earl of Kimberley, in reply, said that the subject was really under the consideration of the Government, which would, in a very short time, owing to the pressure from the War Office and the Admiralty for further accommodation, have to decide what scheme should be adopted for the extension of those offices, and that, of course, would involve acting on the recommendations of the committee of 1878.

The London Water Supply.—In the House of Lords, on the 29th ult., the Bishop of London presented a petition from the National Health Society, and asked whether any measures had been taken or were in preparation by the Government for improving the water supply of the metropolis. From his experience as a London clergyman, he believed that an insufficient supply of water, such as existed in many parts of London, was injurious to the cleanliness, and consequently to the temperance, the morals, and, in the last resort, the religion of the population. The working-classes living in the west of London were particularly ill-supplied. All the circumstances pointed to the necessity of avoiding further delay. It was admitted that the valuable property of the water companies must be bought at a fair price. To ascertain what price should be given, recourse might be had to arbitration. This initial step, he might add, could be taken without the intervention of an Act of Parliament. The Earl of Dalhousie said the Government fully recognised the enormous importance of this question, and it hoped and expected to deal with the matter next year.

Weston-super-Mare.—The new buildings erected for "The Masonic Hall Company," Limited, at Weston-super-Mare, are now almost completed, and will be opened next month. The works have been executed by Messrs. S. T. Harvey & Co. from the designs and under the superintendence of Messrs. Price & Wooler, architects. The new Church Institute, erected in the "Boulevard," Weston-super-Mare, was opened on Wednesday in last week. The contract was carried out by Mr. Robert Shorney, from plans prepared by the same architects.

The Chichester and Midhurst Railway. In connexion with our notice of this line we are asked to add that Messrs. W. S. W. Astbury & Co., of Manchester, Hull, & London, supplied all the oxide of iron paints, varnishes, &c., used for decorating the stations and bridges of the line.

TENDERS

For girls' school, for the East Grinstead School Board. Mr. S. W. Haughton, architect. Quantities by the architect:—

Jones & Co., Gloucester	£1,443 0 0
F. Martin, East Grinstead	1,340 0 0
R. Peat, Rudhill	1,317 0 0
C. Claridge, Banbury	1,220 0 0
J. Waters, Forest-row	1,196 0 0
G. & F. Penn, Pembury	1,185 0 0
J. Morris, East Grinstead	1,100 0 0
H. Martin, East Grinstead	1,094 0 0
Charlwood Bros., East Grinstead	1,065 0 0
Beard, East Grinstead	1,053 0 0
J. Godley, East Grinstead (accepted)	998 0 0

For the fitting-up of public baths, for the Borough of Longton:—

T. Busby, London	£583 12 0
T. Bradford & Co., Manchester	395 10 0
H. & R. Inskip, Longton	380 0 0
Peake Bros., Stoke-on-Trent	375 0 0
Geo & Pemberton, Stoke-on-Trent	356 13 0
G. Plant, Longton (accepted)	315 0 0

For alterations and additions to the Manor House, Locking, near Weston-super-Mare, Somerset. Messrs. Price & Wooler, architects:—

S. T. Harvey & Co. (accepted)	£375 0 0

For road-making and drainage on the Stanford Estate, Preston, Brighton,—Stanford-avenue (continuation):—

Harrison	£5,683 0 0
Woodham	5,683 0 0
Oliver	4,631 10 0
Homewood	3,963 0 0

Accepted for new premises at Jarrow, for the North-Eastern Banking Company. Mr. W. Lister Newcombe, architect:—

J. Storar, Jarrow (mason's work).
Murray & Adam, Jarrow (carpenter, &c., slater, and plumber's work).

For rebuilding the Pineapple public-house, St. George's-road, Southwark. Mr. J. A. J. Woodward, architect:—

Hobern	£4,175 0 0
Simpson	3,790 0 0
Gill	3,785 0 0
Hooper	3,539 0 0
Croaker	3,344 0 0
Kirk (too late)	3,000 0 0

For additional stables for sixty horses, and new carshed, for the North London Suburban Tramways:—Wilkes & Co. (accepted).

For villa residences, Clytha-square, Newport, Monmouthshire. Mr. E. A. Lansdowne, architect. Quantities supplied:—

Stephens & Bastow, Bristol	£2,393 0 0
J. Whittaker	2,390 0 0
Jones & Son	2,171 0 0
Martin	2,159 0 0
Blackborne	2,143 0 0
Moulton & Bromwcombe	2,123 0 0
Wilkins	2,084 0 0
W. Richards	2,074 0 0
Linton	2,047 0 0
L. B. Moore	2,029 0 0
S. Swanton	2,024 0 0

For new Congregational church, Burgess-hill, Sussex. Mr. Edwin J. Hamilton, architect. Quantities supplied:—

		Less for old Iron Church.
J. Barnes, Brighton	£2,529 0 0	£30 0 0
H. Parsons, Brighton	2,501 0 0	20 0 0
Woolgar & Sons, Horsham	2,498 10 0	50 0 0
G. R. Lockyer, Brighton	2,451 0 0	27 0 0
W. Downer, Burgess-hill	2,317 0 0	75 0 0
J. Longley, Turner's-hill	1,955 0 0	40 0 0
S. Norman, Burgess-hill (accepted)	1,995 0 0	100 0 0

For alteration to premises, 316, Park-road, Liverpool, for Mr. James Pratt. Mr. Walter W. Thomas, architect:—

Nicholson & Ayre	£559 0 0

For the erection of a hotel, &c., in St. Domingo-road and Everton Valley, Liverpool, for Mr. James Tarbuck. Mr. Walter W. Thomas, architect:—

W. Tyson & Sons (excavating, drainage, and brickwork)	£592 10 0
W. Thornton & Sons (mason's work)	313 0 0
Nicholson & Ayre (carpenter and joiner's work)	739 0 0
J. Tanner & Son (slater and plasterer's work)	344 0 0
J. Barrows (plumber, painter, and glazier's work)	298 0 0
R. & J. Rankin (smith and iron-founder's work)	80 0 0

For the erection of a villa residence in Sefton Park, Liverpool, for Mr. H. L. Wigan. Mr. Walter W. Thomas, architect:—

G. Morton	£5,500 0 0

For additions to Shaftesbury Hotel, Mount Pleasant, Liverpool, for Mr. J. W. Lloyd. Mr. Walter W. Thomas, architect:—

Brown & Backhouse	£1,154 0 0

For new vaults, &c. in Clifton-road, Tue Brook, for the executors of the late Mr. H. Hornby. Mr. Walter W. Thomas, architect:—

J. Holden	£1,300 0 0

For works in remaking and draining roadways, for the Guildford Urban Sanitary Authority. Mr. H. Peak, surveyor:—

Bright Hill.

Martin, Wells, & Co., Aldershot (accepted)	£167 0 0

Addison Road.

W. Pimm, Guildford	£335 0 0
Martin, Wells, & Co. (accepted)	190 0 0

Cooper Road.

W. Pimm	£360 0 0
Martin, Wells, & Co. (accepted)	360 0 0

Cline Road.

W. Pimm	£230 0 0
Martin, Wells, & Co. (accepted)	165 0 0

Alexandra Place.

W. Pimm	£120 18 0
Martin, Wells, & Co. (accepted)	86 16 0

For cottage residence, New-road, Stoke-next-Guildford. Messrs. Peak, Lunn, & Peak, architects:—

W. Swayne, Guildford (accepted)	£735 0 0

For the erection of grocery stores, warehouses, shop, and house, Bournemouth, for Mr. Lewis Johnson (including value of old buildings). Mr. J. H. Moore, architect:—

Huxtable	£2180 5 9
George	2,025 0 0
Lawson	1,994 16 0
Jones & Son	1,813 0 0
Jeans (accepted)	1,637 5 0

For the erection of stables, &c., for Mr. W. H. Saunders, contractor, Bournemouth (exclusive of certain materials and plant found by owner). Mr. J. H. Moore, architect:—

Griffin	£279 10 0
Jeans	263 0 0
Hoare & Walden	250 0 0
Jones & Son	235 0 0
Stroud	230 0 0

For ten houses, Ferne Park. Messrs. Waymouth, architects:—

Churward	£7,900 0 0
Taylor & Grist	7,690 0 0
Shurmur	7,380 0 0
Morton	6,900 0 0

For bakery, Norwich Workhouse. Mr. John B. Pearce, architect:—

A. Dodman	£1,903 1 9
Benham & Son	1,638 0 0
Newton, Chambers, & Co.	1,594 3 6
J. & J. May	1,490 0 0
R. Tidman & Son	1,441 0 0
Mather & Armstrong	1,427 10 0
Rosser & Russell, No. 1	1,423 0 0
Wand, Fraser, & Co.	1,418 0 0
Rosser & Russell, No. 2	1,384 0 0
G. P. Marshall	1,250 0 0
Barford & Perkins	1,202 0 6
Barnard, Bishop, & Barnard *	1,110 0 0

* Accepted.

For alterations and additions to No. 1, Russell-square, for Mr. N. Davis. Mr. W. Seckham Witherington, architect:—

Gibbings	£1,470 0 0
Whiteley	1,446 0 0
Maple & Co.	1,428 0 0
Scrivener & Co.	1,288 0 0

For rebuilding the Albion public-house, York-road, City-road, for Mr. J. Carter. Mr. Ernest Shum, architect. Quantities by Mr. J. G. Raynes:—

Shurmur	£1,332 0 0
Lister	1,300 0 0
Axford	1,133 0 0
Langmead & Way (accepted)	1,098 0 0

For building stabling and coach-house for Mr. D. Paull, Cavendish-road, Clapham Park. Mr. A. Cawston, architect:—

Garrod	£415 0 0
Potterton	410 0 0
Bushan	335 0 0

For completing four houses in Bedford-hill-road, Balham, for Messrs. Andrew & Cheale, of Tunbridge Wells:—

Potterton (accepted)	£700 0 0

For repairs and alterations to No. 105, Tottenham-court-road, for Mr. James Chambers. Mr. Walter Hall, architect:—

King	£255 10 0
Adams	243 0 0
Martin	230 0 0

For the erection of boundary walls for Mr. Tudor Crawshay, on his Turnham-green Estate. Mr. Walter Hall, architect:—

King	£373 0 0
Westcombe	348 0 0
Adams	317 0 0
Adamson	305 0 0
Ayers	300 0 0

For repairs, &c., to six houses in Sandall-road, Camden road. Mr. Walter Hall, architect:—

Medley	£200 0 0
Jones	180 0 0
Jerrold	175 0 0

For repairs and alterations to No. 127, High-street, Camden-town, for Mr. Sizer. Mr. Walter Hall, architect:—

Keene	£147 0 0
Gould & Brand	147 0 0
Robson	138 0 0

For the erection of a mortuary and contagious diseases wards at St. Matthew's, Bethnal-green, for the Board of Guardians. Messrs. S. & W. Stone, architects:—

Edwards	£1,023 0 0
Beale	1,015 0 0
Steele Bros.	999 0 0
Thomason	990 0 0
Wire	929 0 0
Boyce	927 0 0
Young	910 0 0
Shurmur	891 0 0
Jackson & Todd	880 0 0
Cox	878 0 0
Hunt	845 0 0
Johnson	823 0 0
Judd	795 0 0
Garrett	777 0 0
B. T. Wood (accepted)	777 0 0

Accepted for the erection of a new 40-quarter brewery at Derby, for Messrs. Stretton Bros. Messrs. Scamell & Colyer, architects and engineers. Quantities by Messrs. R. L. Curtis & Sons:—

No. 1.—Building.

H. Lovatt, Wolverhampton	£5,945 0 0

No. 2.—Girders and Columns.

Thornewill & Warham, Burton and Derby	1,325 0 0

No. 3.—Boilers.

Thos. Piggott & Co., Birmingham	760 0 0

No. 4.—Millwrights.

Thornewill & Warham, Burton and Derby	2,297 0 0

No. 5.—Coppers and Underback.

Bindley & Briggs, Burton-on-Trent	735 0 0

No. 6.—Backmakers' Work.

Wilson & Co., Frome	359 0 0

No. 7.—Slate Backs.

Ashton & Green, London	102 0 0

No. 8.—Pipe Connexions, &c.

Bindley & Briggs, Burton-on-Trent	900 0 0

No. 9.—Refrigerator.

Lawrence & Co., London	166 5 6

For pulling down old buildings and the erection of three new houses and shops, at the Broadway, Pritchard's-road, Hackney, for Mr. John Elves. Mr. Edward Brown, architect:—

Marr	£2,673 0 0
Nixon	2,647 0 0
F. & F. J. Wood	2,587 0 0
J. Uff	2,455 0 0
J. K. Johnson	2,353 0 0
Shurmur	2,277 0 0
Salt	2,255 0 0
Hawkins	2,100 0 0

North London Suburban Tramways.—The tender of Messrs. Wilkes & Co., for the extensions from Edmonton to Ponder's-end, has been accepted, and the works will at once be commenced.

Shoreham Workhouse.—The list given in our last should have included Claridge, 9,595*l.* For "Cook & Co." read Crook, 9,107*l.*

TO CORRESPONDENTS.

W. K. B.—E. G.—W. S.—J. H. M.—R. S. R.—T. C. H.—F. T.—F. H. S.—W. F. P.—J. W. H.—J. G. R.—W. J. L.—A. R. B.—M. R. & Co.—T. P.—J. B.—H. J. S.—A. W.—M. & Co.—C. B. & Sons.—W. & Co.—L. & Co.—C. D. P.—W. R. S.—S. & C.—H. H. C.—P. L. & P. W. S. A. & Co.—R. W.—E. J. H.—W. K.—H. & W.—A. W. P.—A. L. R.—E. S. H.—A. R.—J. W. S.—W. M & Co.—J. W.—T. D. B. & Son.—J. W. H.—H. & Co.—A. H.—S. T. H.—S. W. H.—J. A. P.—K. A. L.—G. V.—W. & Co (should in future send names and amounts).—D. M. (ditto).—A. B. (there should be a comma and dash after the word "peruzzita," instead of full-stop).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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Box Ground, Combe Down,
Corsham Down,
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